User Manual for SAS RAID 2108

Dear User of Inspur:

Heartfelt thanks to you for your use of Inspur Product.

In the user manual for our product, operating system installation adopts the installation method based on standard configuration. However, the product you purchased has reinforced functions. For installation of operating systems the product supports, please refer to related part in this user manual.

This manual is the property of the Inspur Group Co., Ltd. Please deliver the package of our product to the waste recycling station for recycling, in favor of pollution prevent and benefit the humankind.

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The Inspur Group Co., Ltd. reserves the right of revise this manual momentarily.

Any alteration about the content of this manual will be noticed. Please contact Inspur Group Co., Ltd., if you have any questions or advice about this manual.

Inspur Group Co., Ltd.

July, 2011

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Regarding the Manual

Chapter1 Introduction on SAS RAID 2108

This chapter mainly introduces the specification, performance, structure, RAID level and other basic knowledge about SAS RAID 2108. Before you use this RAID card, please read carefully this part, especially the RAID level part, which can give you suggestion and advice about what kind fof RAID level suit your application more.

Chapter 2 Driver CD Utility

This chapter mainly introduces the use of driver CD, including how to make the driver in Windows and Linux operating system respectively, and how to use Inspur driver U disk and floppy drive to make the driver. Before installing the system, please read this chapter carefully to properly make the driver, so as to ensure successful operating system installation.

Chapter 3 Operating System Installation Guide

This chapter mainly introduces how to load RAID card driver in Windows and Linux operating system. Detailed steps for operating system installation have been demonstrated in the user manual for this product. If you have any questions during the installation, please refer to Operating System Installation part in the user manual. If you need any further assistance, please contact our customer service center and our professional service engineer will solve installation problems for you.

Chapter4 Configuration and Usage of SAS RAID 2108

This chapter focuses on the configuration and usage of SAS RAID 2108, including how to make, configure and delete RAID. SAS RAID 2108 provides Configuration tool "WebBIOS Configuration Utility", which is based ton Html, to assist administrator maintain and manage the system.

Chapter 5 MSM Software

This chapter mainly introduces the installation,configuration and usage of MSM software on machines installed SAS RAID 2108.

Appendix A Technical Supports

This part provides contact information and service of out technical supports.

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Chapter 1 Introduction on SAS RAID 2108

This chapter mainly introduces the specification, performance and structure of SAS RAID 2108 and basic knowledge about RAID levels. Before using RAID card, please read this chapter carefully, especially RAID levels part, which can offer reference and suggestion on how to select a RAID level that fits your application.

1.1 Product Specification

SAS RAID 2108 is a 6 Gbps and 8-port SAS RAID card. If SAS RAID 2108 has been installed on your computer, please refer to product specifications according to your needs.
One. Product interface specification:
1.Bus interface :PCI-E 2.0 x8 interface
2.SAS interface: every SAS TAID card contains 2Mini SAS SFF-8087x4 internal interfaces.

Two. Description of basic functions
1.Disk Type: supports SAS and SATA hard disk of 6 Gbps and 3Gpbs, supports SDD disk, supports insertion of different types of disks.
2.RAID level: supports multiple Stripe Size settings.
3.Hot backup battery: supports optional hot backup battery.
4.Maximum number of physical disks: Through SAS Expander cascade, each SAS RAID card supports no less than 120 disks.
5.Maximum number of virtual disks: no less than 64
6.Hot spare function: supports Global hot spare function and hot spare function for specified array.
7. Disk location: supports Disk LED location in both WebBIOS and Operating System.
8. Online capacity expansion: supports online capacity expansion.
9. RAID level immigration: supports RAID level immigration
10. Auto rebuild function: After fault hard disk is replaced with new disk, RAID can be auto rebuilt.
11. Background initialization: After creating a new RAID, background initialization is supported.
12. RAID Array Drive Roaming: Drive roaming is supported. It means that RIAD configuration and disk data will not lose after the same type of SAS RAID card is replaced.
13. Firmware update: supports firmware update .
14. Disk location and fault disk LED alarm: Through SGPIO transport protocol, hard disk LED location and fault hard disk LED indication can be achieved.
15. Beeper alarm: Beeper alarm is available in case of disk fault and offline.
16. Virtual drive verification or virtual disk conformity test and fixing function are supported.

Three. Disk Management
1. Supports Disk management by means of WebBIOS.

2. Supports disk management in command line .
3. Supports Disk management in operating system , Windows operating system preferred.
Four. Product Performance
Under the same test environment, it has equivalent performance with 6 Gbps SAS RAID sta
Five. Reliability
MTBF: more than 400,000 hours
Six. Product Structure
Low-profile card and half-length cards have both low-profile and full-profile I/O tailgates.
Seven. Operating System Compatibility: Following operating systems and monitoring software are compatible. Windows Server 2003 x32/x64
Windows Server 2008 x32/x64
Red hat Enterprise Server 4.x x32/x64
Red hat Enterprise Server 5.x x32/x64
Suse Linux Enterprise Server 11 x32/x64
Suse Linux Enterprise Server 10 SP2 x32/x64
Centos 5.2 Enterprise Server x32/x64
Centos 5.1 Enterprise Server x32/x64
Free BSD 7.0 and more advanced edition
Eight. Product Craft
1.RoHS:10 years
2.EMC Class B
Nine. Working Environment
1. Working temperature:0℃~55℃
2. Relative humidity:5%~90%，Non-condensing。

1.2 Introduction on RAID Basic Knowledge

RAID, an acronym for Redundant Arrays of Independent Disk, is a cheap redundant disk array. RAID falls into soft array and hard array. Soft array is achieved through software, which needs computer processor to provide computing capacity and only basic RAID fault tolerance functions are available. Hard array means that separate hard ware, RAID card for example, provides control and computing functions of whole disk arrays. Separate processor is available on RAID card, independent of system CPU resource. All necessary fault tolerance functions are available for hard RAID, so it can provide better functions and performance than soft array.
SAS RAID 2108 card supports RAID 0, 1, 5, 6, 10, 50, 60, Simple Volume and JBOD. It also supports multiple Stripe Size settings. Here we give a brief introduction on RAID levels characteristics.

RAID level- RAID 0
1. Characteristics: Data is transferred among over two disk drives, parallel with I/O system to improve I/O performance. If n represents the number of disks, each disk drive stores one nth of data.
2. Application: Relatively higher read and write performance, but the data is not redundant. RAID0 itself is only suitable for the applications that have fault tolerance for data access and data that can be

rebuilt in other approaches.

RAID level – RAID1
1. Characteristics: Disk image is supported, which can protect data and improve data read performance. RAID1 can build data image in over two disks, which are very similar. RAID1 adopts n plus n protection mode, so double number of disks is required.
2. Application: It enjoys relatively high performance and reliability in reading operation-intensive OLTP and other transaction data. Other applications also benefit from RAID1, for example, e-mail, operating system, application files and random access environment.

RAID level - RAID0+1
1. Characteristics: Data stripe and image are available, and n plus n drives are used, enjoying higher stripe performance and image reliability. In case of one disk drive fault, performance and reliability will not be affected. But in RAID0, drive fault will affect performance and reliability. Furthermore, disk stripe technology will improve performance.
2. Application: OLTP and I/O intensive application ask for high performance and reliability, including transaction log, log file, data index etc. The total cost is calculated based on each I/O operation, rather than each storage unit cost.

RAID level - RAID1+0(RAID10)
1. Characteristics: Similar to RAID0+1, data stripe and image are available, and n + n drives are used, enjoying higher stripe performance and image reliability. RAID10 differs from RAID0+1 in achieving image functions following centralized stripe of all disks.
2. Application: OLTP and I/O intensive applications necessitate high performance and reliability, including transaction log, log file, data index etc. The total cost is calculated based on each I/O operation, rather than each storage unit cost.

RAID level – RAID5
1. Characteristics: Disk stripe and floating parity protection mode are provided in n+1 mode, providing high reliability for most users and I/O stream concurrent operation and enjoying high read performance. Vacant disk drives can be used to rebuild data (disk rebuild), so as to prevent data from re-destroying after disk rebuild.
2. Application: Reduce the number of necessary disks and provide good reliability and read performance. If write cache is not used, write performance will be affected to some extent. Applications RAID5 suits including relational data, read-intensive database form, file sharing and web application.

RAID level – RAID6
1. Characteristics: Disk stripe and floating parity are provided in double parity mode, which are designed to minimize the influence on data reliability during disk rebuilding, especially when using high-capacity fiber channel and SATA disk drives. The problem for RAID6 and other multiple-drive parity mode lies in that parity is necessary when writing data or rebuilding fault disk drives, when performance will be affected.
2. Application: In general, if you want to achieve high performances read and write operations; using

small disk drive is feasible, avoiding using RAID6. On the other hand, if you want to store mass data, but storage position may be rebuilt. Proper configuration of RAID5 and RAID6 can meet application requirement.

1.3 Introduction on Essential Terms of RAID

1. Battery backup: Normally, it is optional, which provides data protection for RAID cache after power failure in some special applications. Generally, it can only protect data security for cache within 72 hours after power failure. Once the system restores, cache data will be re-written to hard disks or other storage system. As battery has a limited life, it is required to replace a new one when it is charged for about 1100 times.

2. Hot fix (hot spare) disks: Hot fix disk can automatically replace the failed disk having matched capacity and the array starts rebuilding action in case where one or two disks in array failed.

Notes: Be sure that the capacity of hot fix disk is equal to or more capacious than the largest disk to be protected.

3. Array Roaming compatibility: It allows complete RAID array transfer from one server system to another and ensures the completeness of data and configuration information. Array roaming is based on the premise of compatibility between RAID controllers for two systems, that is, RAID configuration information written into disks shares the same data format. The feature also allows replacing another compatible one in case of a RAID card on server failed, to prevent data in disk array from losing.

4. Array level migration: As data application changes in user storage array, it is possible to bring the performance of array into full play only by changing RAID level, when RAID level migration is required. Different array level migration is supported depending on RAID cards we provided, generally, only migration among RAID0, RAID1 and RAID5 can be supported and data completeness can be ensured.

5. Initialize background: RAID card supports operating system installation and other operations during building disks array through background initialization. Of course, you can install operating system after the initialization, and the installation will be more quickly in this way.

6. Online capacity expansion without reboot (OCE): It allows adding new physical drives to the array that is configured and completes build task, to achieve capacity expansion on the server without supporting reboot. For some of RAID cards we provided, the OCE function can only achieve online capacity expansion for part of RAID levels like RAID0, RAID5 AND RAID10 in Windows 2000, NT and NetWare operating systems, while server reboot is required in other operating systems. It is estimated that storage demand will go up at the rate of 30 percent annually. The features of OCE can gradually satisfy users' growing demand on storage in several steps, and lay foundation for policy formulation.

7. Auto rebuild: When a disk failed, the system will automatically enable hot spare disk or detect a new disk that is inserted to the same ID location and has a capacity larger than or equal to the failed one. Then the system will automatically start rebuild operation.

Chapter 2 Driver CD Utility

This chapter mainly introduces the use of driver CD, including how to make the driver in Windows and Linux operating system respectively, and how to use Inspur driver U disk and floppy drive to make the driver. Before installing the system, please read this chapter carefully to properly make the driver, so as to ensure successful operating system installation.

2.1 Driver Making With RAID CARD Driver CD

Make RAID Card Driver CD automatically run or manually run the setup.exe in the root directory, the following screen appears:

1.Click Make Driver, the following screen appears:

Make Floppy Driver
Dear Inspur User:
According to your needed installation OS, please choose the following items in the dropdown menu, insert the Inspur U disk, click [Make Driver] button, finish the Driver making.
Please select OS:
Make Driver
Close
www.inspur.com

2.Select an operating system that you want to install in the pull-down menu of Operating System Selection, and click Make Driver. The Driver Creation screen will vary depending on the selected operating system. Here we give instructions respectively:

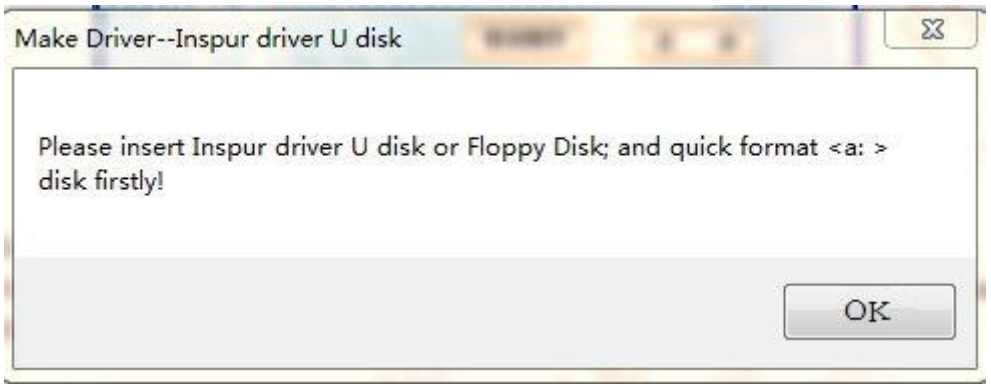
2.2 Driver Making for Windows Operating System

When making the Driver for Windows operating system, the Driver will be directly copied to the virtual floppy drive A: for the Inspur driver U disk. Select a Windows Operating System version, and click Make Driver, as shown in below figure:

Make Floppy Driver
Dear Inspur User:
According to your needed installation OS, please choose the following items in the dropdown menu, insert the Inspur U disk, click [Make Driver] button, finish the Driver making.
Please select OS:
Windows 2003-X64 server
Make Driver
Close
www.inspur.com

The following screen appears where the system prompts “Please insert Inspur driver U disk or Floppy

Disk; and quick format <a;> disk firstly". Please confirm the Inspur driver U disk has been connected, then format the virtual floppy drive. Then click [OK] to start the Driver Making.



When the process completes, the system pops up a window prompting that Driver Making completes, and then click [OK].

2.3. Make the Driver for RedHat Linux

1. When making the Driver for RedHat Linux operating system, the Driver will be copied to the normal partition of the Inspur driver U disk, as shown in below figure. Select a Red Hat Linux version you want to install, click [Make Driver].

Make Floppy Driver
Dear Inspur User:
According to your needed installation OS, please choose the following items in the dropdown menu, insert the Inspur U disk, click [Make Driver] button, finish the Driver making.
Please select OS:
Redhat5.4 for Inspur drive U-
Make Driver
Close
www.inspur.com

As shown in figure below, the system prompts "Please insert Inspur driver U disk or Floppy Disk", connect the USB drive to your PC and click [OK].

The system starts driver copy, soon the following window pops up prompting that the Driver Making completes, click [OK].

2. Make Driver in Floppy Disk

Please select "RedHat 5.4 for Inspur drive U-",whose name is correspondent with its own version. Different version may use different names.

Select a Red Hat Linux version you want to install, click [Make Driver].

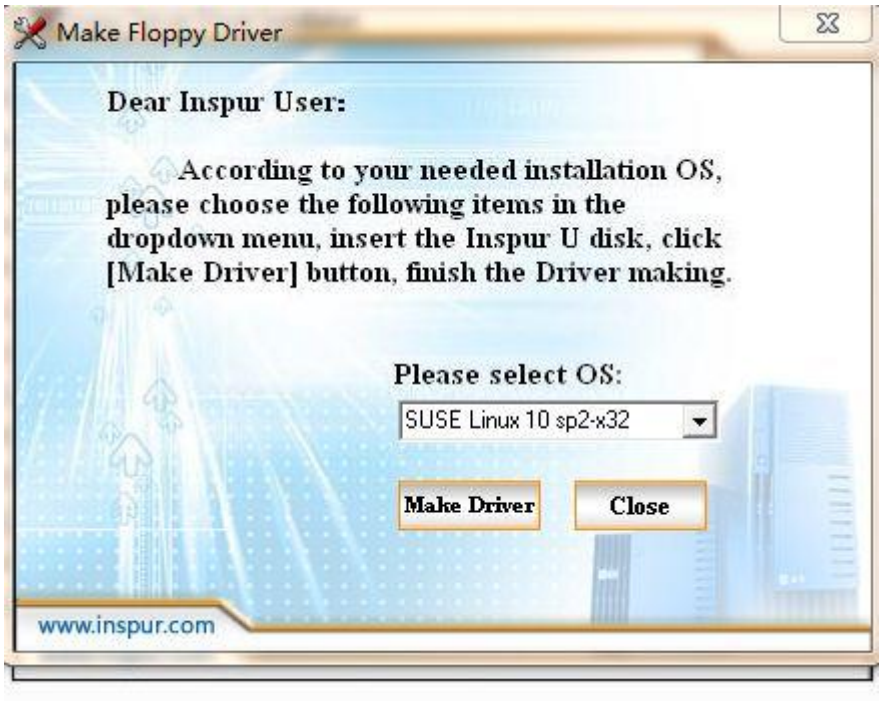
Make Floppy Driver
Dear Inspur User:
According to your needed installation OS, please choose the following items in the dropdown menu, insert the Inspur U disk, click [Make Driver] button, finish the Driver making.
Please select OS:
Redhat5.4 for Inspur drive U-
Make Driver
Close
www.inspur.com

The following screen appears where the system prompts “Please insert Inspur driver or Floppy Disk; and quick format <a;> disk firstly”. Please confirm the Inspur driver U disk has been connected, then format the virtual floppy drive. Then click [OK] to start the Driver Making.

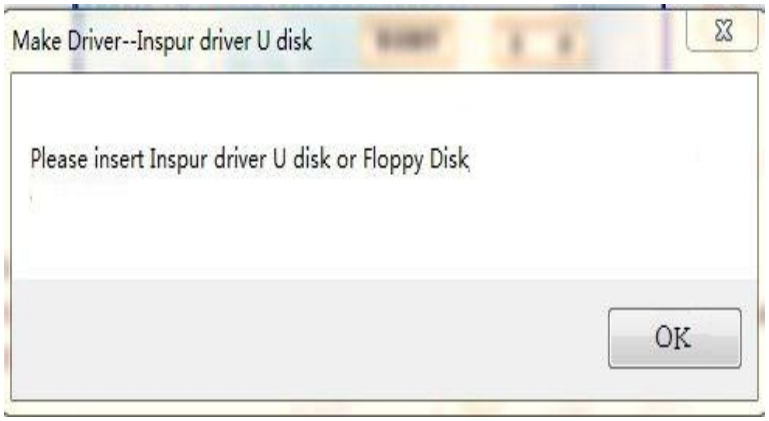
The system pops up a window prompting that Driver Making completes, and then click [OK].

2.4. Make the Driver for Suse Linux Operating System

When making the Driver for Suse Linux operating system, the Driver will be directly copied to the virtual floppy drive A: for the Inspur driver U disk. Select a Suse Linux Operating System version you want to install, and click [Make Driver], as shown in the figure below:


Make Floppy Driver
Dear Inspur User:
According to your needed installation OS, please choose the following items in the dropdown menu, insert the Inspur U disk, click [Make Driver] button, finish the Driver making.
Please select OS:
SUSE Linux 10 sp2-x32
Make Driver
Close
www.inspur.com

As shown in figure below, the system prompts “Please insert Inspur driver U disk or Floppy Disk”, connect the USB drive to your PC and click [OK].



The system begins to copy the Driver. Soon the system pops up a window prompting that Driver Making completes, and then click [OK].

Chapter 3 Operating System Installation Guide

This chapter mainly introduces how to load RAID card driver in Windows and Linux operating system. Detailed steps for operating system installation have been demonstrated in the user manual for this product. If you have any questions during the installation, please refer to Operating System Installation part in the user manual. If you need any further assistance, please contact our customer service center and our professional service engineer will solve installation problems for you.

3.1 Windows Server 2003 Operating System Installation

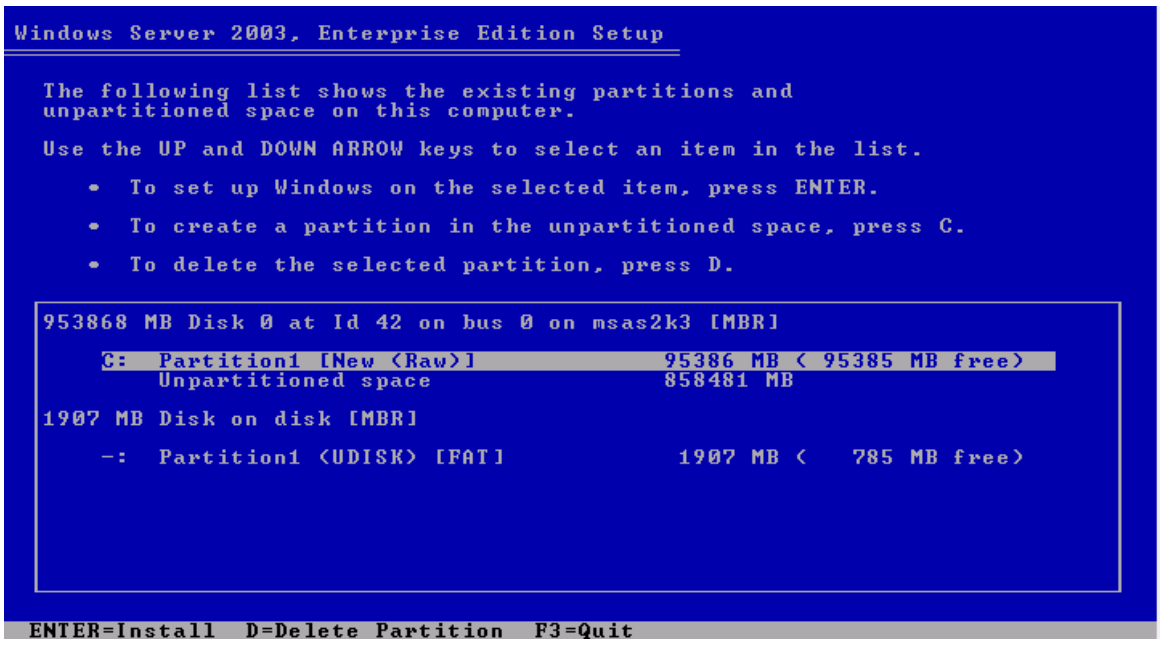
1. Use the above method to copy the Driver on hard disk drive to the virtual floppy drive A: for the Inspur driver U disk;

2. Connect the Inspur driver U disk to your PC, boot the server, insert the Operating System Installation CD into your CD-ROM drive, and enter BIOS settings to enable Boot from CD-ROM Drive;

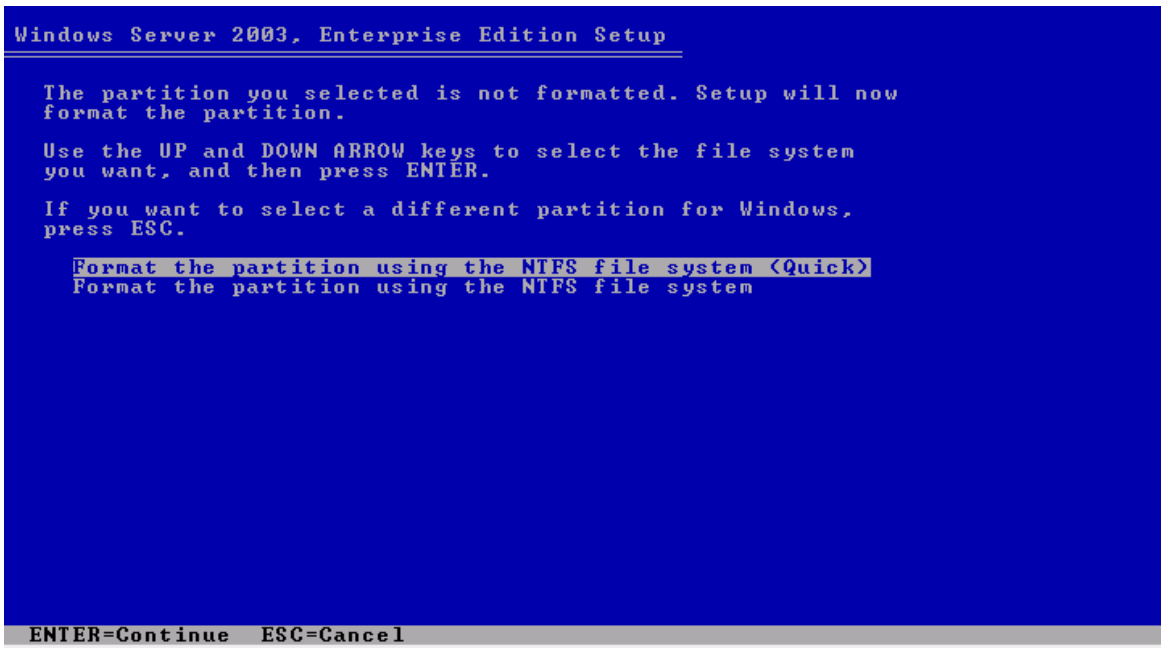
3. When the screen appears “Press F6 if you need to install a third party SCSI or RAID driver...”, press to install the driver;

4. When the system displays “setup could not determine the type of one or more mass storage…… ”, press [S]. Press [Enter], the system then displays the list of drivers contained in the Inspur driver U disk. You can select an appropriate driver, and then press [Enter] to automatically install the driver;

5. Follow instructions to continue the installation program; the Disk Partition screen appears, listing all existing partitions and unpartitioned space on the server. The Inspur driver U disk occupies a drive letter, as shown below:


Windows Server 2003, Enterprise Edition Setup
The following list shows the existing partitions and unpartitioned space on this computer.
Use the UP and DOWN ARROW keys to select an item in the list.
• To set up Windows on the selected item, press ENTER.
• To create a partition in the unpartitioned space, press C.
• To delete the selected partition, press D.
953868 MB Disk 0 at Id 42 on bus 0 on msas2k3 [MBR]
C: Partition1 [New (Raw)] 95386 MB (95385 MB free)
Unpartitioned space 858481 MB
1907 MB Disk on disk [MBR]
-: Partition1 (UDISK) [FAT] 1907 MB (785 MB free)
ENTER=Install D=Delete Partition F3=Quit

On the above screen, as the hard disk drive has no existing partitions, the USB drive occupies the C:drive letter. If the hard disk has existing partitions and the USB drive occupies the D: drive letter, you need to delete all partitions on hard disk D and make new partitions again, the USB drive will not occupy hard drive letter anymore. The following steps are shown as pictures below,


Windows Server 2003, Enterprise Edition Setup
The partition you selected is not formatted. Setup will now format the partition.
Use the UP and DOWN ARROW keys to select the file system you want, and then press ENTER.
If you want to select a different partition for Windows, press ESC.
Format the partition using the NTFS file system (Quick)
Format the partition using the NTFS file system
ENTER=Continue ESC=Cancel

Follow the prompts of the system and complete the installation.

Notes: Be sure to distinguish the USB drive and hard drive and must not delete or format the USB drive.

6. Follow instructions to continue until Windows 2003 operating system is installed.

3.2 RedHat Linux Operating System Installation

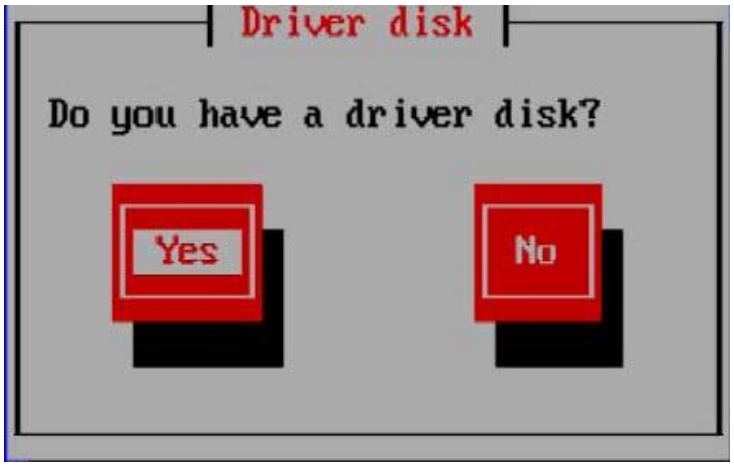
Note: The Inspur driver U disk only supports the creation of Driver under Red Hat Linux 4.5 operating system or above, and the Driver has to be copies to the normal partition of USB drive.

1. Use the above method introduced to copy the HDD controller Driver to the normal partition of USB drive (Note: Not allowed to copy to the virtual drive A:);

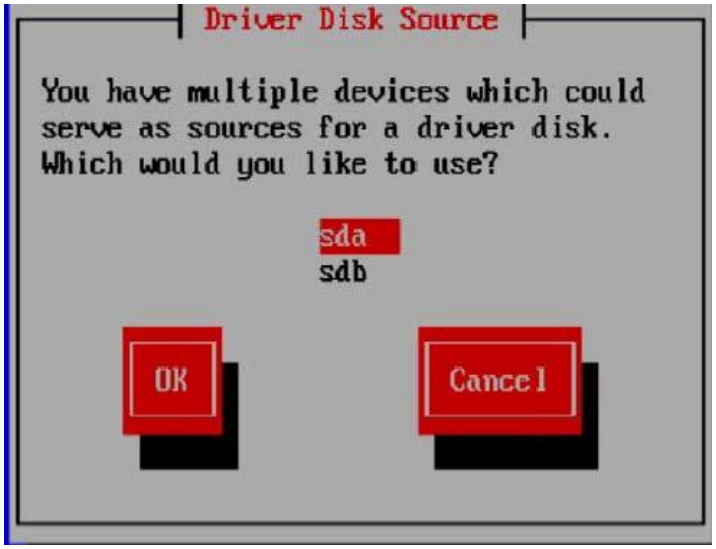
2.Connect the Inspur driver U disk to your PC, power up the server, insert the Operating System Installation CD into your CD-ROM drive, and enter BIOS settings to enable Boot from CD-ROM drive;

3. Enter linux dd when prompting boot:, and press [Enter] to continue;

4. You are prompted that “Do you have a driver disk?”, click <Yes>, and press [Enter] to continue;



5. You are prompted to select Driver Disk Source, select sda and click <OK>;


Driver Disk Source
You have multiple devices which could serve as sources for a driver disk. Which would you like to use?
sda
sdb
OK
Cancel

6.Select </dev/sda1> on the pop-up window and click OK to continue;

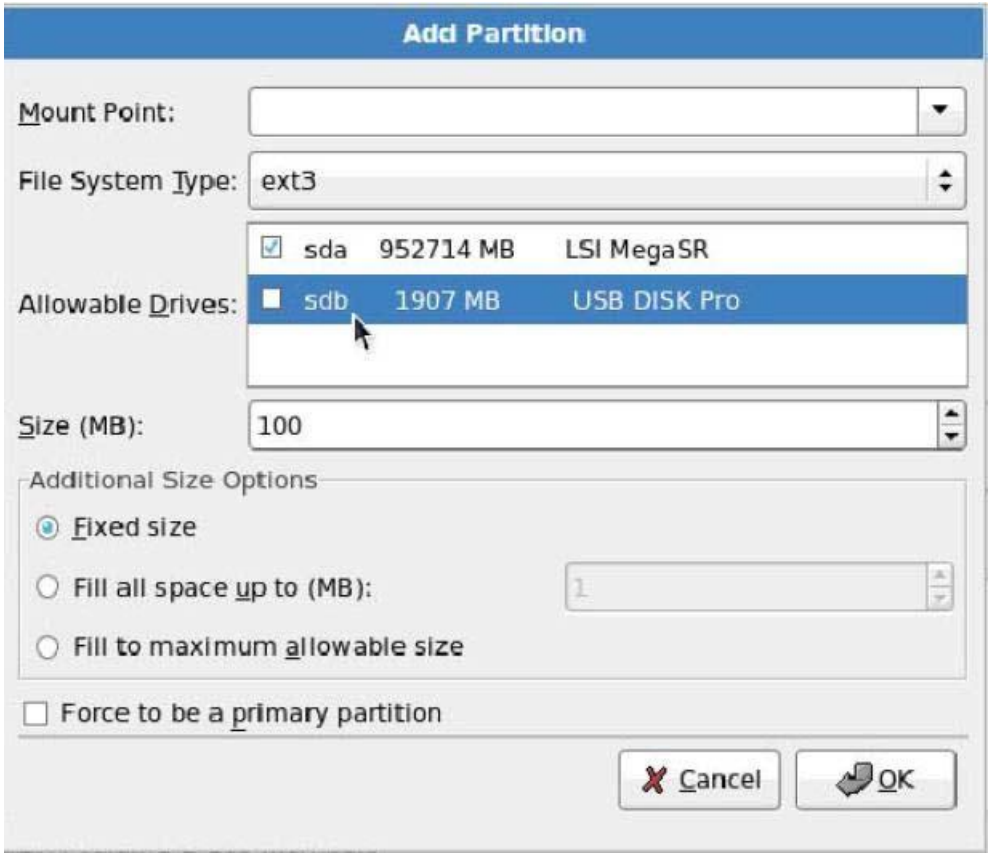
Driver Disk Source
There are multiple partitions on this device which could contain the driver disk image. Which would you like to use?
/dev/sda1
OK
Back

7. In case where the USB drive contains several drivers, the Driver Selection window appears, where you can select a proper driver and click <OK> and press [Enter]. Then the system begins to install the driver, and the following window pops up to prompt whether to add other drivers upon completion of

the installation.

8. If you need to add other drivers, click Yes and follow above instructions to add other drivers. If no other drivers to add, select No and following instructions to complete the installation of Red Hat Linux operating system.

As shown in the figure below, sdb 1907MB USB DISK Pro represents USB drive. Uncheck USB drive in the File System Type during the partition creation.



Note: Under RedHat Linux 5.0 operating system or above, the system can automatically detect USB drive during the partition creation. Be sure to uncheck USB drive in the File System Type to avoid

creating partition on USB drive.

3.3 SUSE Linux 10 SP2 Operating System Installation

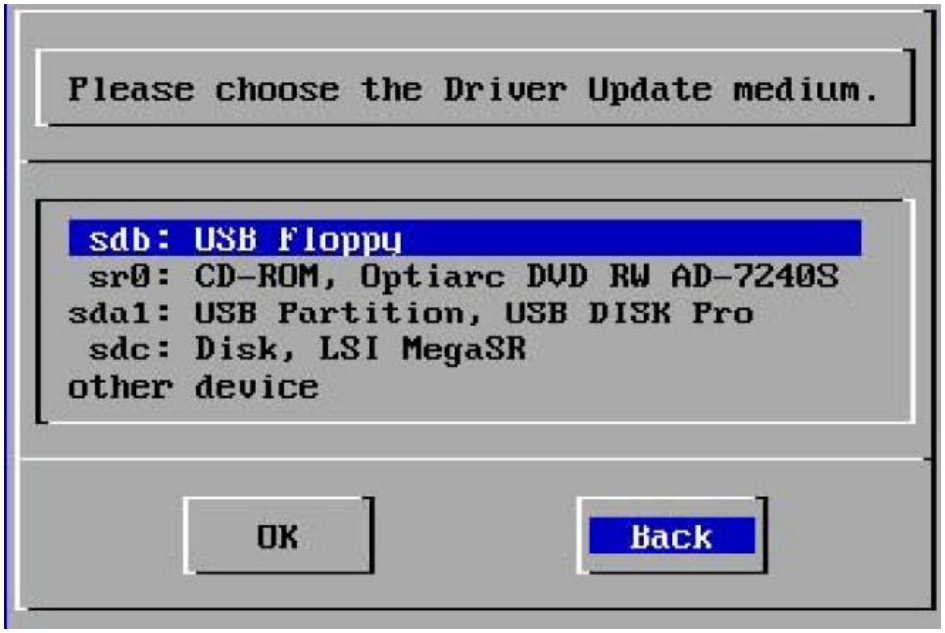
1. Use the above method introduced to copy the HDD controller Driver to the virtual floppy drive A: for the Inspur driver U disk; (if the driver is written to the normal partition of USB drive, it can't be installed.)

2. Connect the Inspur driver U disk to your PC, power up the server, insert the Operating System Installation CD into your CD-ROM drive, and enter BIOS settings to enable Boot from CD-ROM drive;

3. On the Boot Options screen, press [F5] and a window pops up. Click <Yes> and press [Enter], select Installation and press Enter to install the Driver (it will need several minutes, please wait…);

4. Upon completion of the driver installation, it prompts installed driver name, select <OK> to continue;

5. Enter into the screen as shown below:



6. As the Driver Installation completes, select <Back> to continue;

7. Follow instructions to complete the installation of Suse Linux operating systems.

Note: Be sure to distinguish the USB drive and hard drive during the partition definition and must not delete or format the USB drive.

Chapter 4 Configuration and Use of SAS RAID 2108

SAS RAID 2108 provides a Html-based configuration tool - WebBIOS Configuration Utility, while MCM depends on operating system.

4.1 Introduction on WebBIOS Configuration Utility

WebBIOS CU enables you to build and manage RAID configuration on LSI logic's SAS controller. Unlike MegaRAIDStorage Manager™ (MSM) software, WebBIOS CU is built in BIOS of SAS controller, but independent on operating system. WebBIOS CU can achieve the following operations:

1. Build physical array and logic drive for storage configuration.
2. Delete virtual disk.
3. RAID level migration and configuration deletion.
4. Display properties for adapter, valid disks, physical drives and battery backup units.
5. Initialize virtual disk.
6. Check data consistency configuration

WebBIOS CU provides a configuration wizard guiding you through logic drive and physical array configuration steps.

4.2 Start WebBIOS CU

To start WebBIOS CU and enter into the main screen , follow these steps:

1. Startup host, and press the <Curl> and H key when the following texts appears:

   Copyright© LSI Logic Corporation

   Press <Curl><H> for Pebbles

   Adapter option window appears.

2. If multiple adapters are available in the system, select one and enter into.

3. Press [Start] to continue, then WebBIOS main screen appears.

4.3 WebBIOS CU Main Interface

In Post period, when "Press [Ctrl][H] For WebBIOS" appears on the screen, please press [Ctrl] plus [H], the system will enter RAID configuration interface, as figure 4-1 shows,

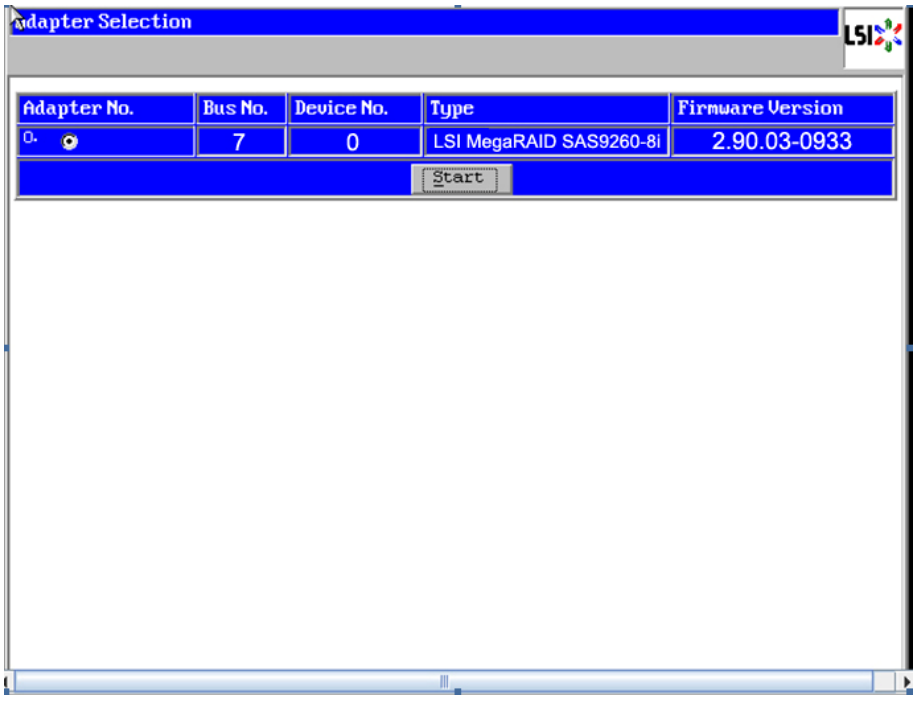


figure 4-1

When the cursor falls on the [Start] key, please press [Enter] to enter the interface as figure 4-2 shows.

Attention: When mouse is inactive, press [TAB] button to shift.

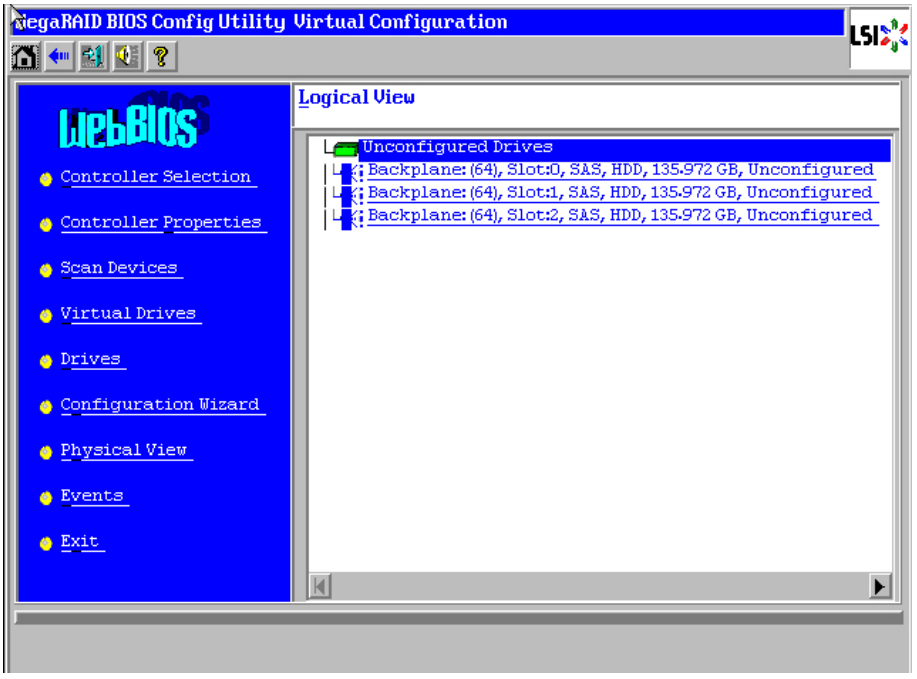


Figure4.2

Table 4.1 Introduction on WebBIOS Toolbar Icons

Icon	Function Description
	Click this icon to return to main screen from any other WebBIOS screen.
	Click this icon to return to previous screen that you were viewing.
	Click this icon to exit the WebBIOS program.
	Click this icon to turn off the sound on the onboard controller alarm.
	Click this icon to display information about the WebBIOS version and browser version.。

The following is the basic description of menus listed on the left side of WebBIOS main screen, and detailed description can be referred to following chapters.

Attention: Press [TAB] button to shift.

4.4 Introduction on SAS RAID 2108 Main Menu

This sector mainly explains the menu of setting program, including disk array create and view.

4.4.1 Controller Selection Menu

If there are several controllers in the system, use this option to select an adapter.

4.4.2 Controller Properties Menu

Controller Properties option explains how to use WebBIOS to observe and change properties of adapters, virtual drives and physical drives.
As picture 4-2 shows, select [Controller Properties] and press [Enter], the system will enter the following screen.

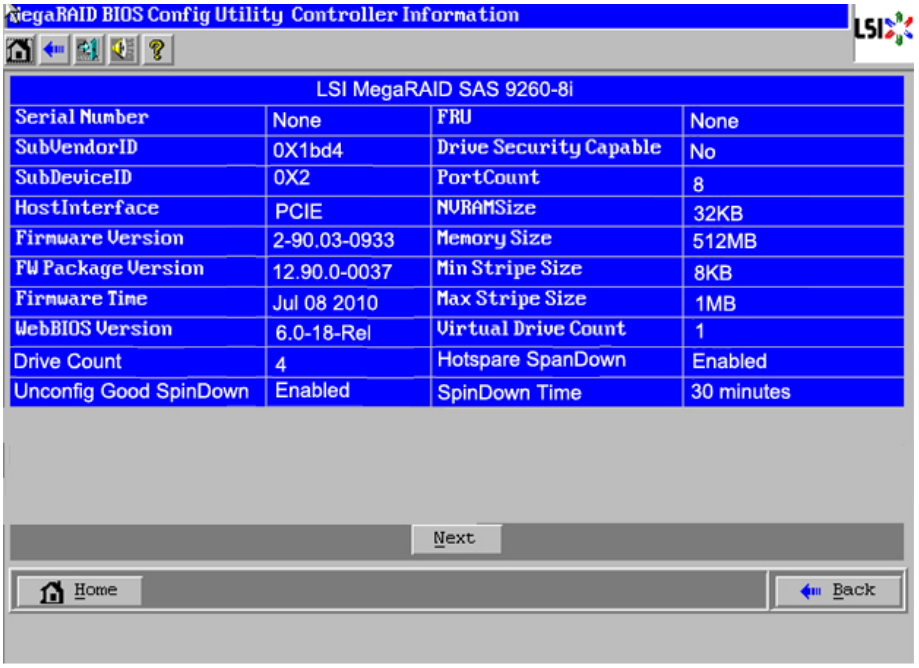


Figure 4-3

This screen displays read-only properties that cannot be modified directly. The screen lists the number of virtual drives that have been defined on this adapter and the number plus the number of physical drives connected to the adapter.

The system will enter a more specified interface by clicking [Enter].

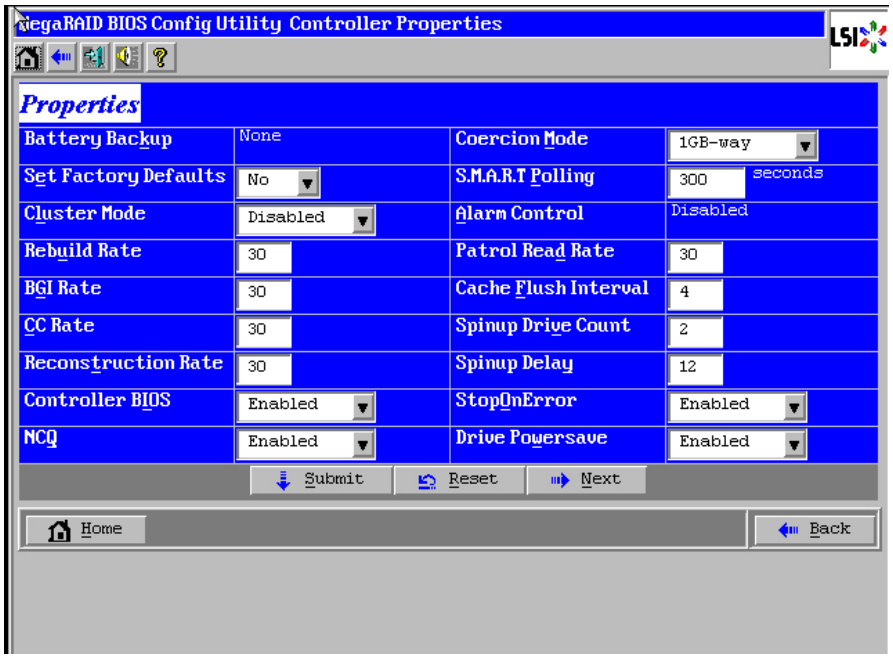


Figure
4-4

4.4.3 Scan Devices Menu

Select this option to re-scan for any changes in the status of drives and physical configuration. WebBIOS displays physical drives and logical drives record scanned.

4.4.4 Virtual Drives Menu

Select this menu to view virtual drives, where you can change and view properties of virtual drives, delete virtual drive, initialize drive and perform other tasks, as shown in below figure:

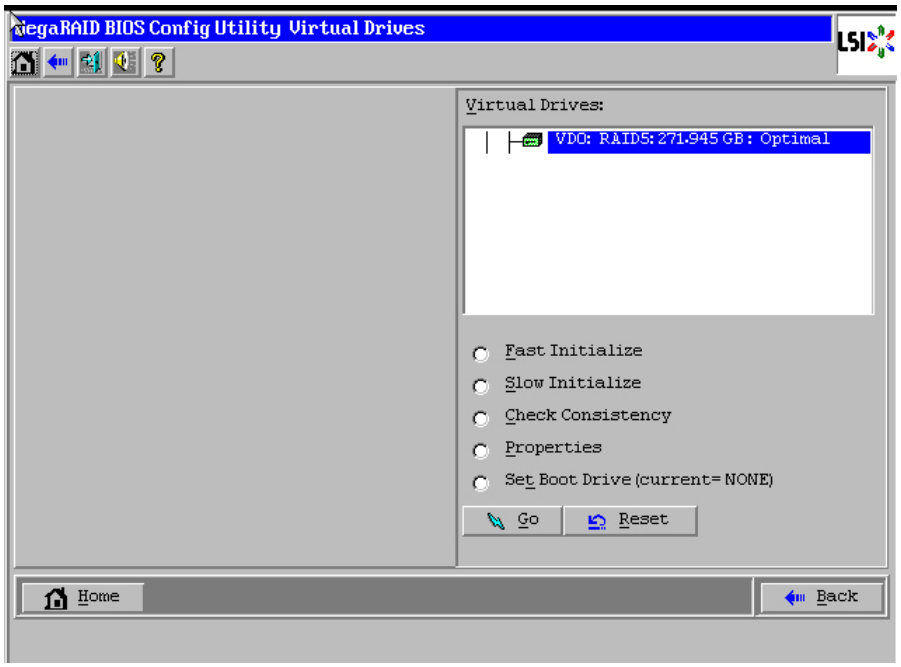

MegaRAID BIOS Config Utility Virtual Drives
LSI
Virtual Drives:
VD0: RAID5: 271.945 GB : Optimal
Fast Initialize
Slow Initialize
Check Consistency
Properties
Set Boot Drive (current= NONE)
Go
Reset
Home
Back

Figure
4-5

Select [Properties] and [Go], the system will enter into the below figure.

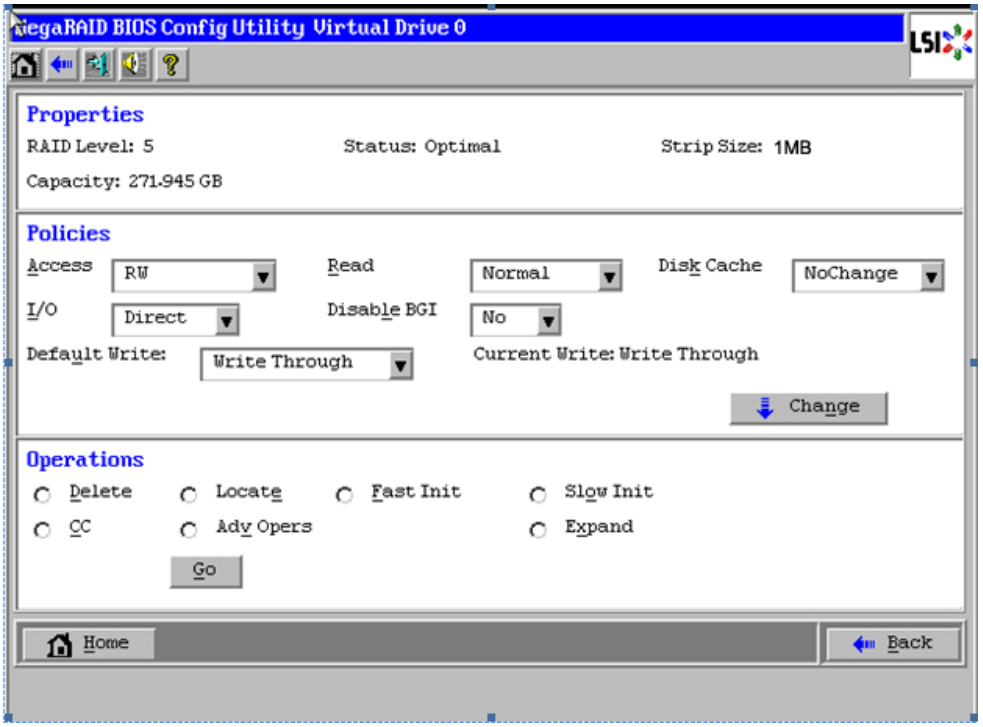


Figure
4-6

Properties panel displays RAID properties, RAID policies and other RAID options, for example, delete [Del] button and move cursor to [Go] button, RAID array will be deleted.

After storage configuration is rebuilt, defined virtual drive policies will be listed on policies panel. To change any policy, change in pull-down menu and then click [Change].

4.4.5 Drives Menu

Select this menu can enter into physical devices view screen, where you can view and change physical drive properties, as shown in below figure:

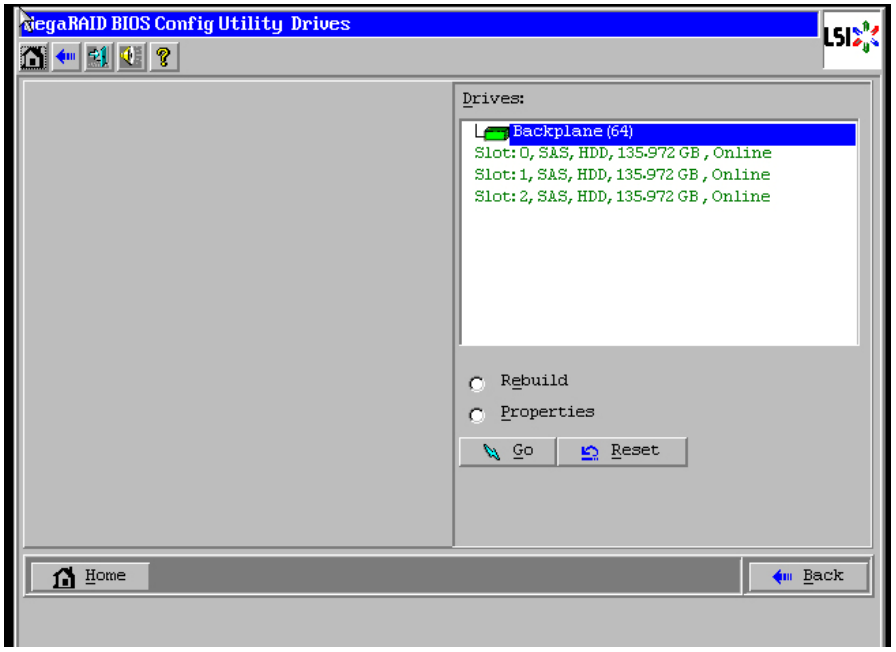


Figure
4-7

After physical drive are selected, click [Properties] option and [Go] button as shown in above screen, then below screen appears, where you can achieve force physical drive offline and other operations.

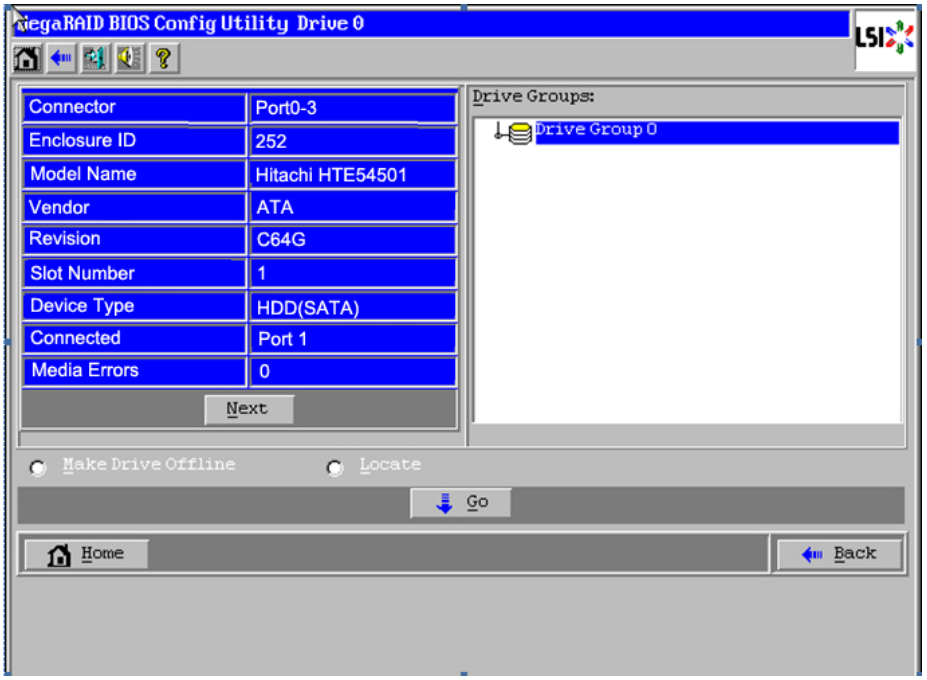


Figure 4-8

Physical device properties are read only and custom description, including physical device status.

Change in operations list depends on physical drive status. If an operation is selected, click [Go] to start.

1. Select [Make Drive Offline] to force physical drive offline.

2. Select [Locate] to enable LED for corresponding physical device on front panel to blink. This function is available only when hard drive location is supported, while other configurations might not support this function.

3. If a selected hard disk is separate from disk array, it can be used as global hot spare disk or partial hot spare disk for certain array.

4.4.6 Configuration Wizard Menu (RAID array create)

This sector explains how to use WebBIOS configuration wizard to set RAID array and virtual drive. The following steps show how to start configuration wizard:

1. On WebBIOS main screen, click [Configuration Wizard], then the first configuration wizard screen appears, as shown in figure 4-9:

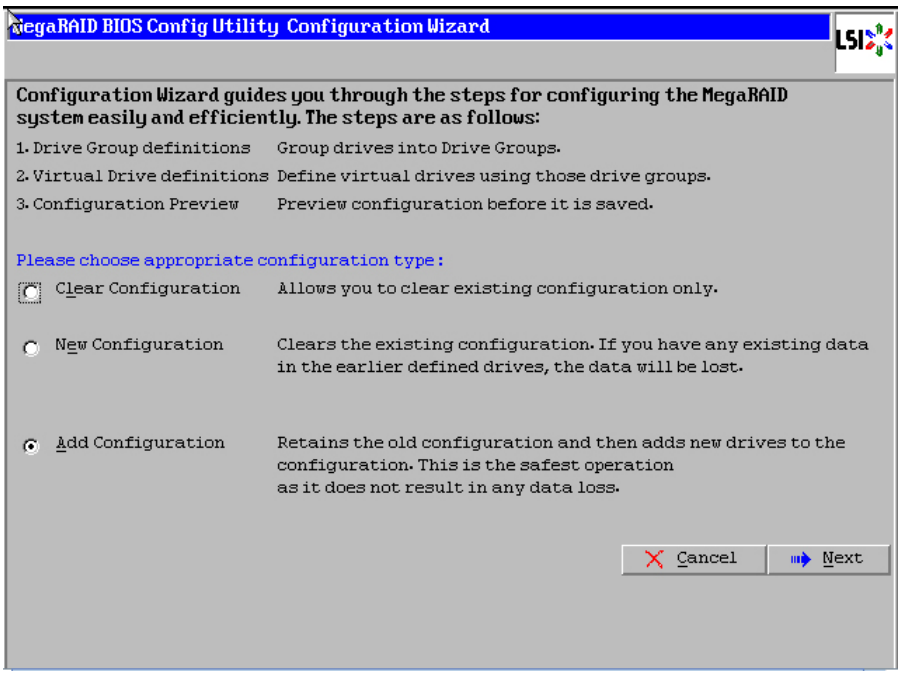

MegaRAID BIOS Config Utility Configuration Wizard
LSI
Configuration Wizard guides you through the steps for configuring the MegaRAID system easily and efficiently. The steps are as follows:
1. Drive Group definitions Group drives into Drive Groups.
2. Virtual Drive definitions Define virtual drives using those drive groups.
3. Configuration Preview Preview configuration before it is saved.
Please choose appropriate configuration type:
Clear Configuration Allows you to clear existing configuration only.
New Configuration Clears the existing configuration. If you have any existing data in the earlier defined drives, the data will be lost.
Add Configuration Retains the old configuration and then adds new drives to the configuration. This is the safest operation as it does not result in any data loss.
Cancel
Next

Figure 4-9

2. Select a configuration option.

Warning: If the first or second option is selected, all data in the settings will be deleted. Be sure to

back up the data you want to save before choosing these options.

---Clear Configuration: Clear current configuration.

---New Configuration: Clear current configuration and guide you to create a new configuration.

3. Click [Next], and the system will prompt

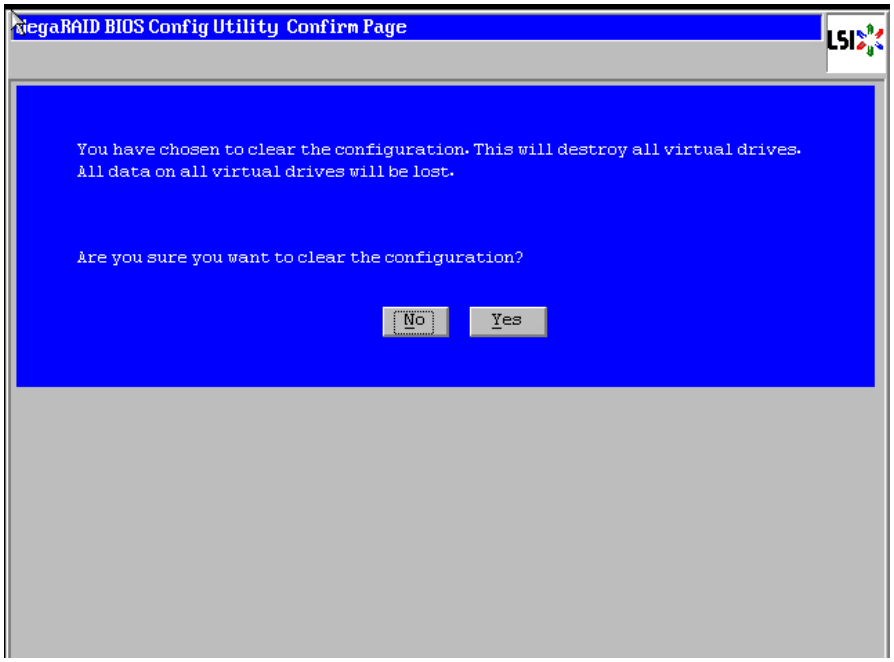

MegaRAID BIOS Config Utility Confirm Page
LSI
You have chosen to clear the configuration. This will destroy all virtual drives.
All data on all virtual drives will be lost.
Are you sure you want to clear the configuration?
No
Yes

Figure
4-10

4. System prompts that this operation will destroy the data on all virtual drives. Click [Yes] to continue, or click [No] to go back to previous page, as picture 4-2 shows.

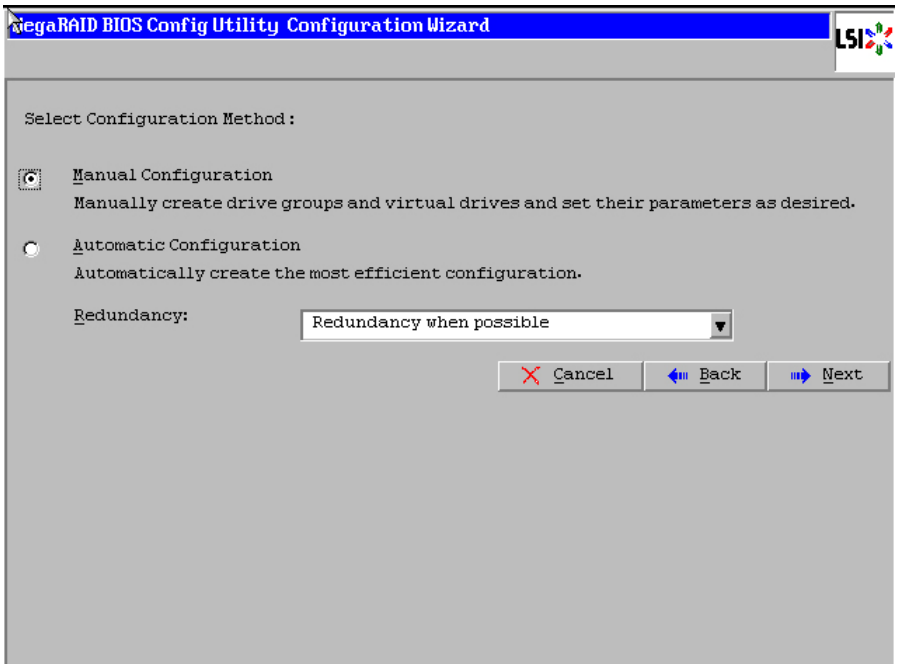

MegaRAID BIOS Config Utility Configuration Wizard
LSI
Select Configuration Method:
Manual Configuration
Manually create drive groups and virtual drives and set their parameters as desired.
Automatic Configuration
Automatically create the most efficient configuration.
Redundancy:
Redundancy when possible
Cancel
Back
Next

Figure
4-11

5. On previous screen, select a configuration mode:

---Manual Configuration: Create a disk array manually and set all properties of storage array.

---Automatic Configuration Redundancy when possible: Make an optimum RAID1 or RAID5 automatically, providing data redundancy. It is preferred to configure RAID.

---Auto Configuration without Redundancy: Create a RAID0 configuration without redundancy automatically.

As picture 4-11 shows, click [Next] to go to the interface in picture 4-12.

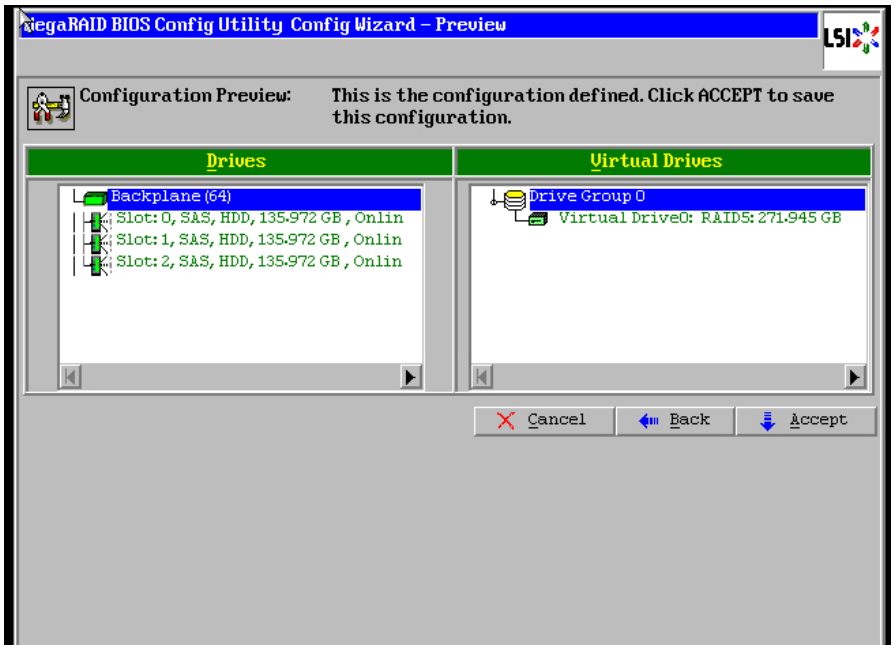

egaRAID BIOS Config Utility Config Wizard – Preview
LSI
Configuration Preview:
This is the configuration defined. Click ACCEPT to save this configuration.
Drives
Virtual Drives
Backplane (64)
Slot: 0, SAS, HDD, 135.972 GB , Onlin
Slot: 1, SAS, HDD, 135.972 GB , Onlin
Slot: 2, SAS, HDD, 135.972 GB , Onlin
Drive Group 0
Virtual Drive0: RAID5: 271.945 GB
Cancel
Back
Accept

Figure 4-12

Here we give an introduction on making RAID automatically and manually respectively.

Automatic configuration utility:

The following steps show hot to make a RAID configuration without redundancy automatically.

1. As shown in figure 4-12, click [Accept] to accept configuration (or click [Back] to change configuration). If [Auto Configuration with Redundancy] is selected, WebBios will create RAID5 when there are three available disks. It will create RAID1 when there are only two available disks.

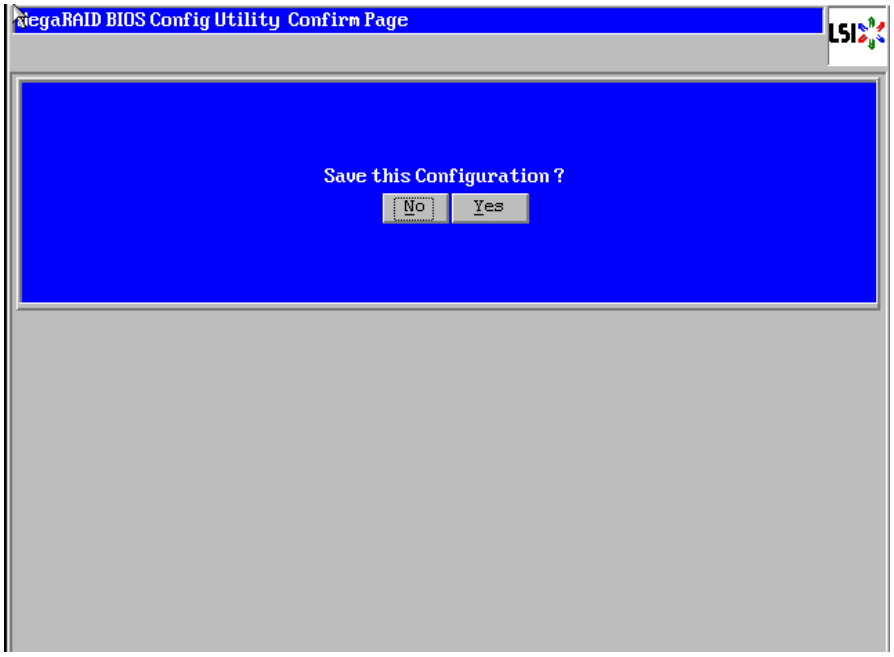


Figure
4-13

When the system prompts [Save this configuration?], click [Yes].The system will prompts a screen as picture 4-14 shows.

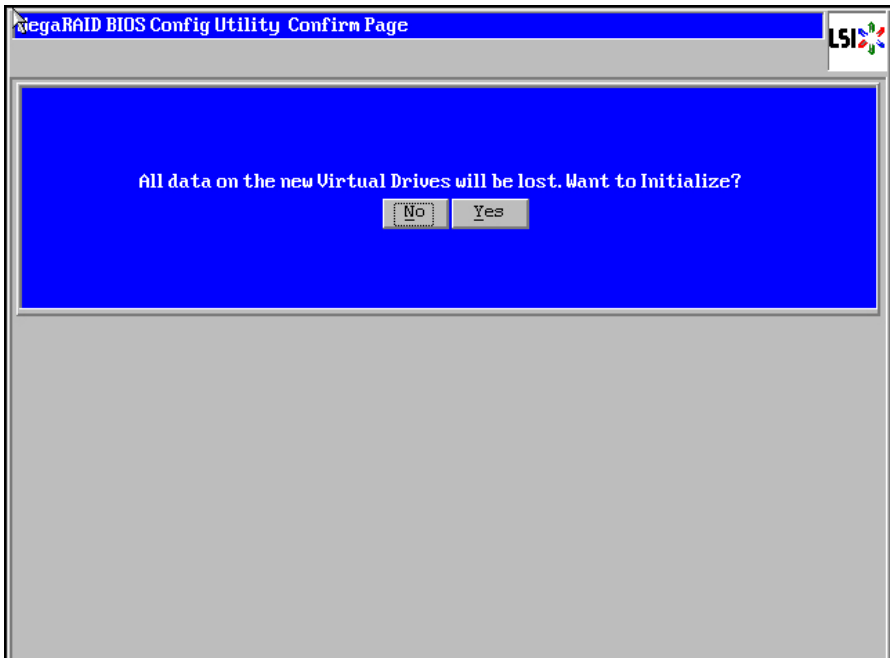


Figure
4-14

3. When you are prompted to initialize virtual drive, click [Yes], and then WebBIOS will begin to

initialize virtual drive in background mode.

On the screen shown in figure 4-11, select Manual Configuration and click [Next], and the following screen appears, as shown in figure 4-15:

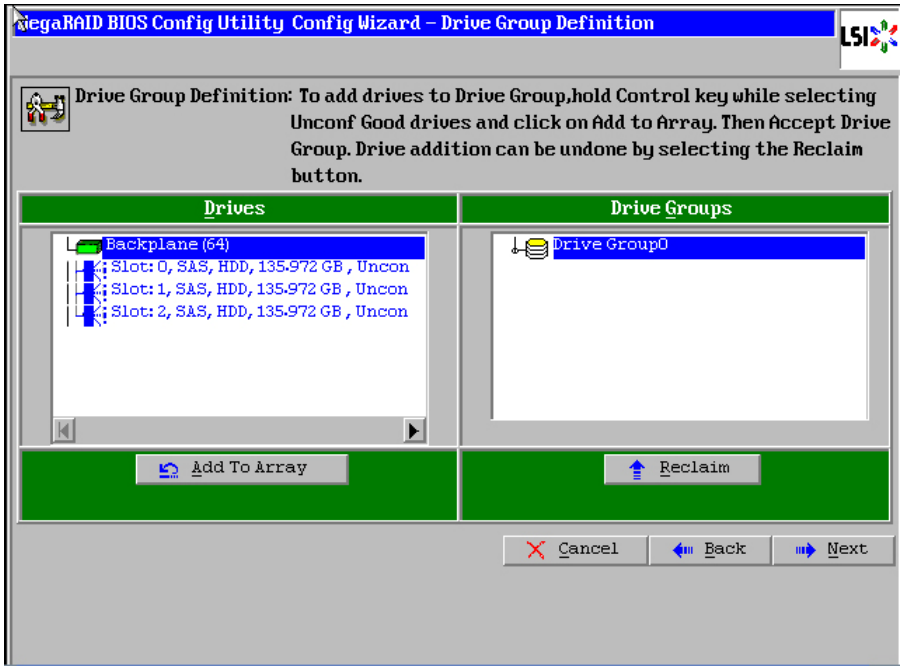

MegaRAID BIOS Config Utility Config Wizard – Drive Group Definition
LSI
Drive Group Definition: To add drives to Drive Group,hold Control key while selecting Unconf Good drives and click on Add to Array. Then Accept Drive Group. Drive addition can be undone by selecting the Reclaim button.
Drives
Drive Groups
Backplane (64)
Slot: 0, SAS, HDD, 135.972 GB , Uncon
Slot: 1, SAS, HDD, 135.972 GB , Uncon
Slot: 2, SAS, HDD, 135.972 GB , Uncon
Drive Group0
Add To Array
Reclaim
Cancel
Back
Next

Figure 4-15

On the disk Group Definition screen, select physical hard disk to create disk array.

1. Press [ALT+D] to enter disk selection state, press [Shift] and select physical drive that are ready to create disk array on the left side of the window. Move cursor to [Add To Array], press Enter, and then the following screen appears as shown in figure 4-16.

Attention

Select two physical drive to create RAID1 array and select three physical drive to create RAID5 array.

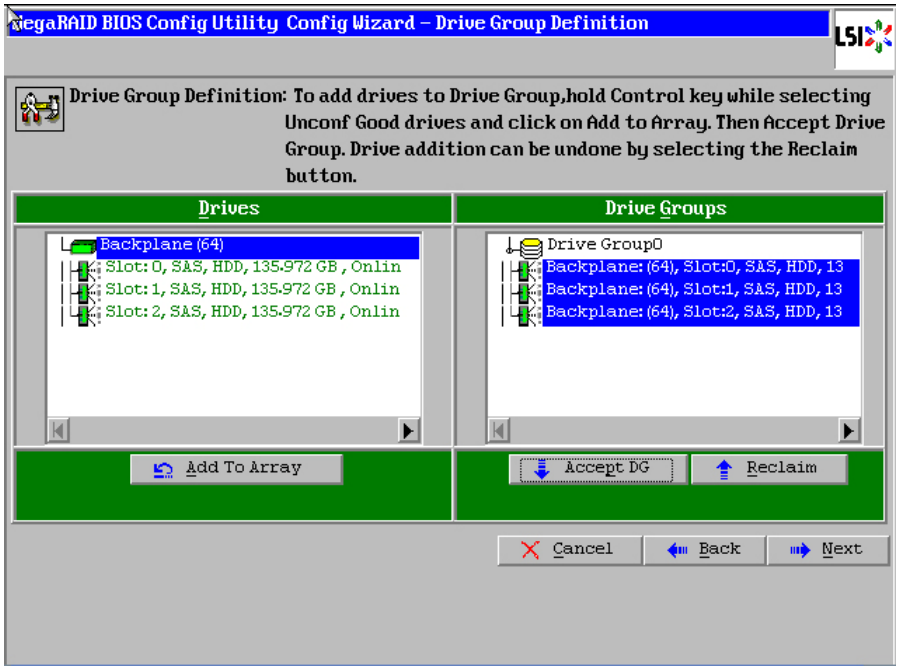

MegaRAID BIOS Config Utility Config Wizard – Drive Group Definition
LSI
Drive Group Definition: To add drives to Drive Group,hold Control key while selecting Unconf Good drives and click on Add to Array. Then Accept Drive Group. Drive addition can be undone by selecting the Reclaim button.
Drives
Drive Groups
Backplane (64)
Slot: 0, SAS, HDD, 135.972 GB , Onlin
Slot: 1, SAS, HDD, 135.972 GB , Onlin
Slot: 2, SAS, HDD, 135.972 GB , Onlin
Drive Group0
Backplane: (64), Slot:0, SAS, HDD, 13
Backplane: (64), Slot:1, SAS, HDD, 13
Backplane: (64), Slot:2, SAS, HDD, 13
Add To Array
Accept DG
Reclaim
Cancel
Back
Next

Figure4-16

2. Click [Accept DG] to move disk that is ready to make disk array to the right side of disk array window.

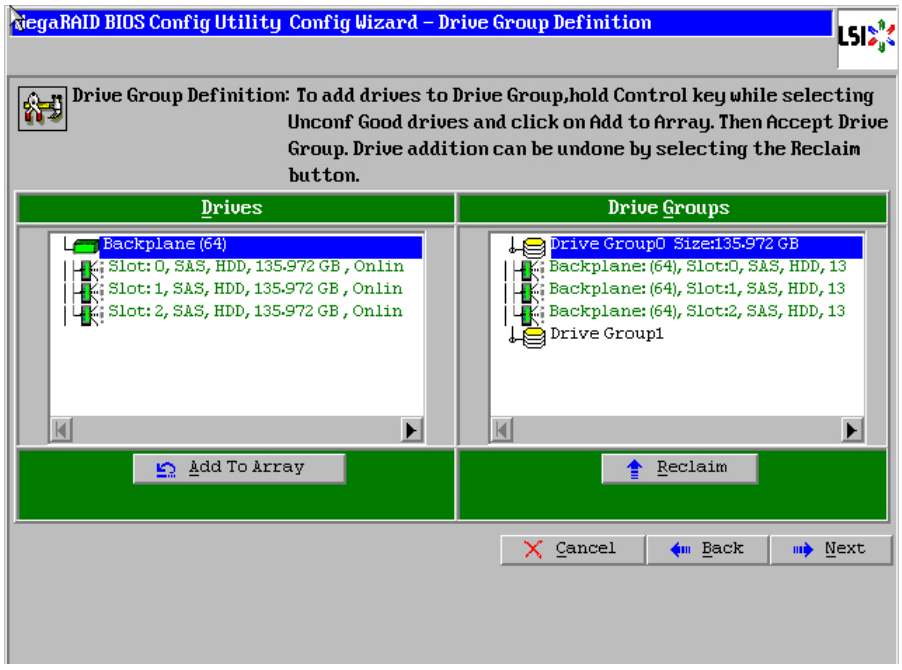

MegaRAID BIOS Config Utility Config Wizard – Drive Group Definition
LSI
Drive Group Definition: To add drives to Drive Group,hold Control key while selecting Unconf Good drives and click on Add to Array. Then Accept Drive Group. Drive addition can be undone by selecting the Reclaim button.
Drives
Drive Groups
Backplane (64)
Slot: 0, SAS, HDD, 135.972 GB , Onlin
Slot: 1, SAS, HDD, 135.972 GB , Onlin
Slot: 2, SAS, HDD, 135.972 GB , Onlin
Drive Group0 Size:135.972 GB
Backplane: (64), Slot:0, SAS, HDD, 13
Backplane: (64), Slot:1, SAS, HDD, 13
Backplane: (64), Slot:2, SAS, HDD, 13
Drive Group1
Add To Array
Reclaim
Cancel
Back
Next

Figure4-17

To undo the change, click [Reclaim] button.

3. Upon selection, click [Next], and then the Virtual Drive Definition screen appears, as shown in

figure 4-18.

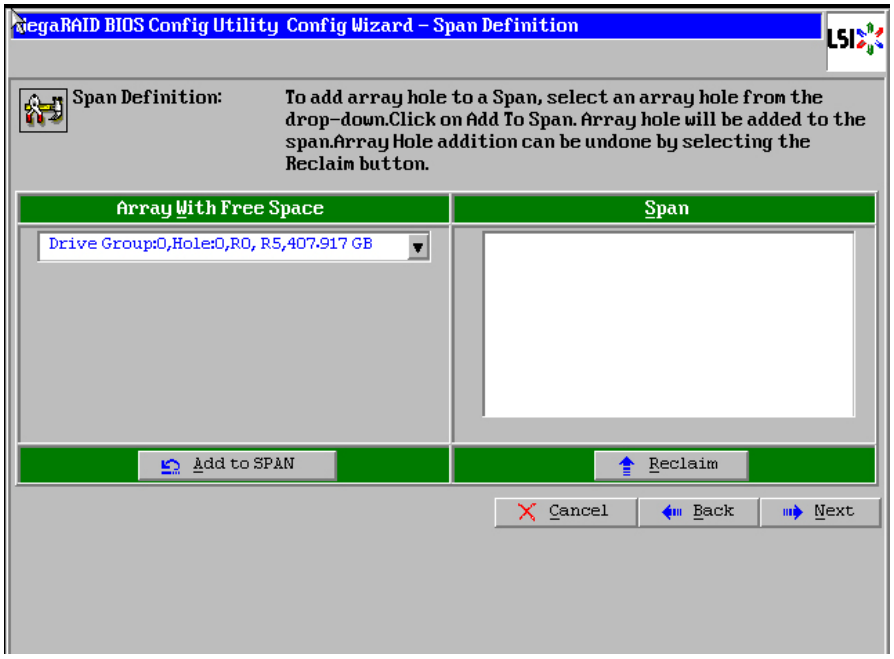

MegaRAID BIOS Config Utility Config Wizard – Span Definition
LSI
Span Definition:
To add array hole to a Span, select an array hole from the drop-down.Click on Add To Span. Array hole will be added to the span.Array Hole addition can be undone by selecting the Reclaim button.
Array With Free Space
Span
Drive Group:0,Hole:0,R0, R5,407.917 GB
Add to SPAN
Reclaim
Cancel
Back
Next

Figure4-18

Select [Add to SPAN] to add array to the Span pool on the right side, click [Next] and press Enter. The following screen appears as shown in figure 4-19:

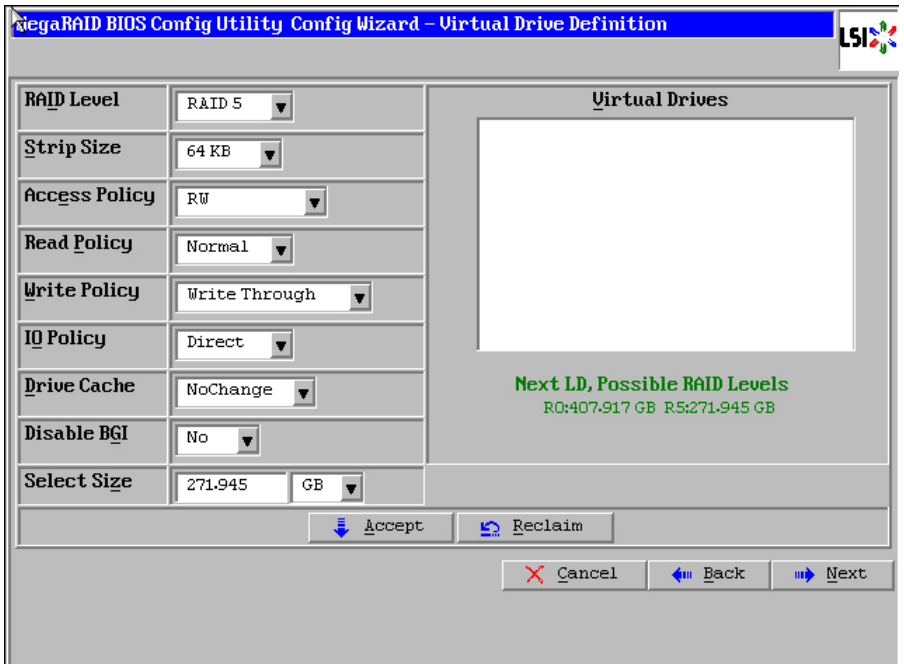


Figure4-19

4. You can select RAID level, strip size, read and write policy and other properties of new virtual

drive on the screen shown in figure 4-19.

5. If it is unnecessary to modify properties of virtual drives, default properties will be displayed on the screen.

Here we give a brief introduction on options of virtual drive:

RAID Level: Pull-down menu lists RAID levels that virtual drive can create.

Strip Size: Stripe size specifies a size of strip to write in RAID configuration. Available strip sizes are 8, 16, 32, 64 and 128 kilobytes. A large strip size will improve read performance significantly. If computer performs random access request regularly, it is recommended to select a small strip size.

Access Policy: Select a data access type allowed by virtual drive. Available options are Read/Write, Read Only and Blocked.

Read Policy: Specify a read policy for disk array. Available options:

Ahead: This option has read-ahead capacity, allowing controller to read-ahead requested data to memory through estimating data to be used. It will improve the speed of continuous data reading, but impose little impact on random data access.

Normal: Selecting this option will close Read Ahead function.

Adaptive: When proper read-ahead is selected, controller will first adopt Read Ahead. If the last two disk accesses occur in continuous sectors, but read request is random, the controller will return to Normal status (non-read-ahead).

Write Policy: Specify read policy of virtual drives.

Wback: write back. In write back mode, controller will send a transmission completion signal to host when the controller has processed received data. This option is recommended as standard mode.

Wthru: In Writethrough mode, controller will send a data transmission completion signal to host when disk sub system has received all data transmitted.

Bad BBU: Select this mode when controller has no BBU or BBU has failed, but you need controller to use Writeback mode. If this mode is not selected, controller's Firmware will automatically shift to Writethrough mode when the controller detects BBU failure or can't detect BBU.

IO Policy：IO policy is suitable for reading special virtual drive. It imposes no impact on reading ahead cache.

Drive Cache: drive cache policy option. Available status: open, close and unchanged.

Disable BGI: Select [No] to allow opening background initialization, which means that a new configuration can be initialized in background mode during performing other configuration task using WebBIOS. Select [Yes] to disable background initialization.

Select size: Specify capacity of virtual drive in Megabyte. Normally, it is recommended to select the

maximum size listed on the right panel of configuration screen. If you want to make several virtual drives in one disk array, it is advisable to specify a relatively small size.

6. Click [Accept] to accept changes on virtual drives, or click [Reclaim] to go back to previous settings.

7. Click [Next] upon completion of all virtual drive definitions, and the following screen appears:

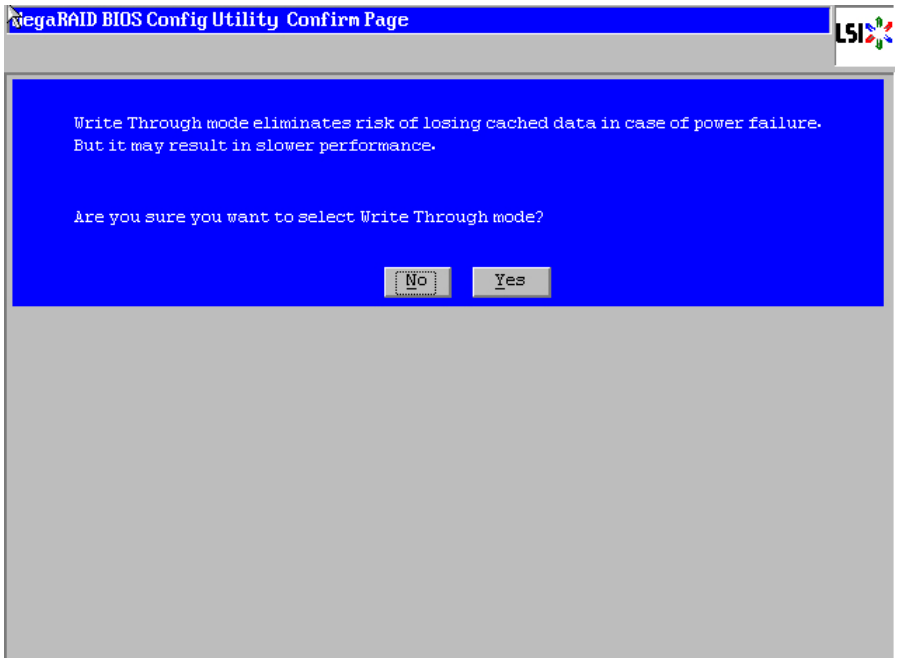

MegaRAID BIOS Config Utility Confirm Page
LSI
Write Through mode eliminates risk of losing cached data in case of power failure.
But it may result in slower performance.
Are you sure you want to select Write Through mode?
No
Yes

Figure 4-20

8. Select [Yes] to enter information screen in configuration test preview:

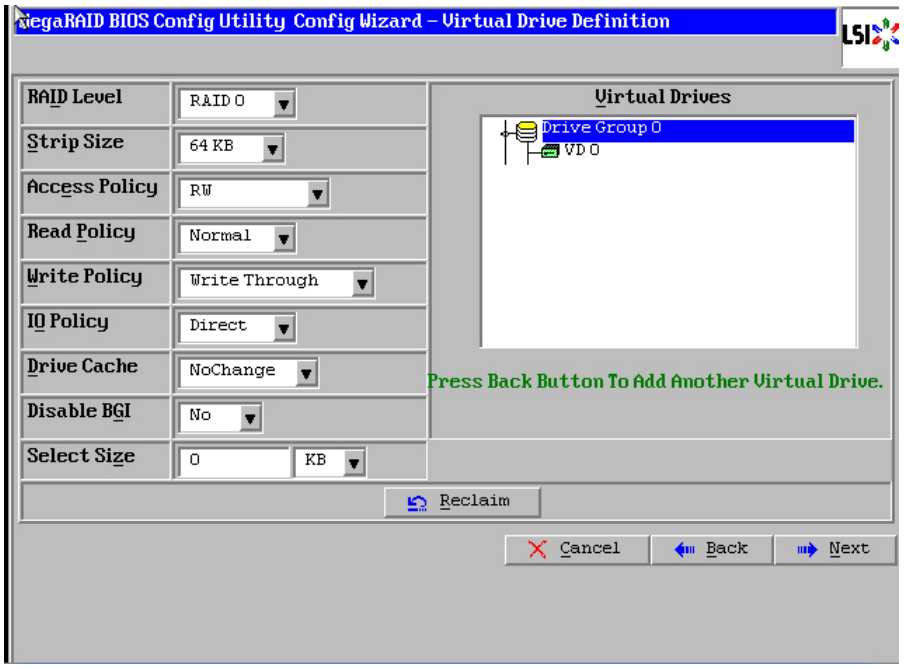


Figure 4-21

9. If virtual drive configuration is accepted, click [Next] to enter the screen below

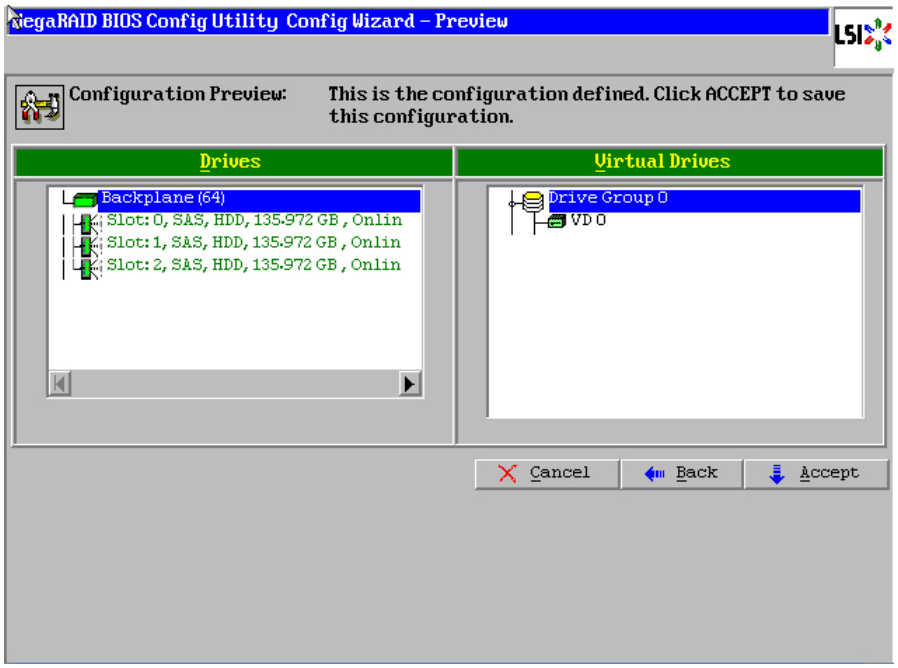


Figure 4-22

10. If disk configuration above is confirmed, click [Accept] to enter the screen below:

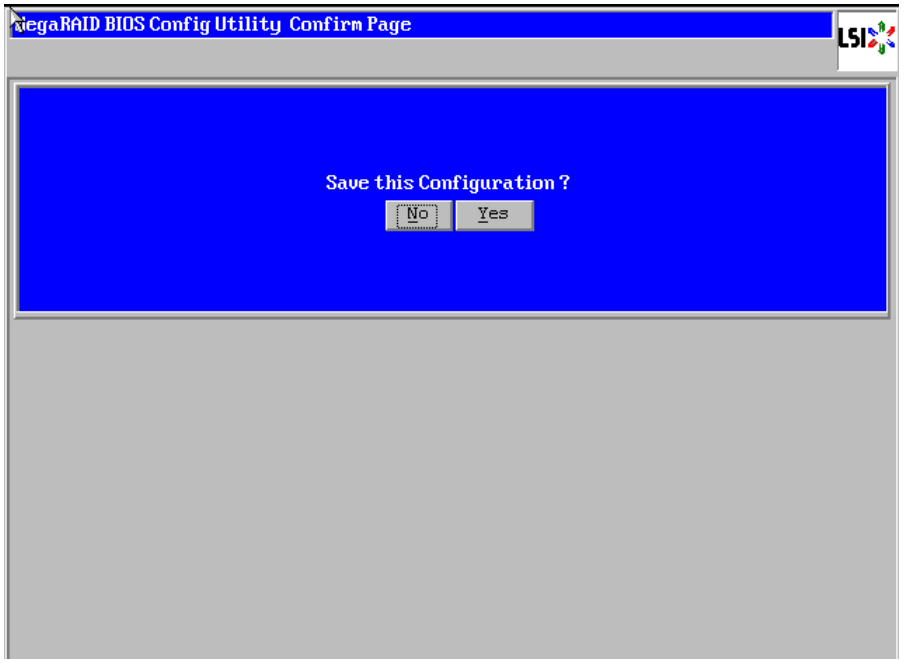


Figure 4-23

11. Click [Yes] to save the configuration,
and the system prompts

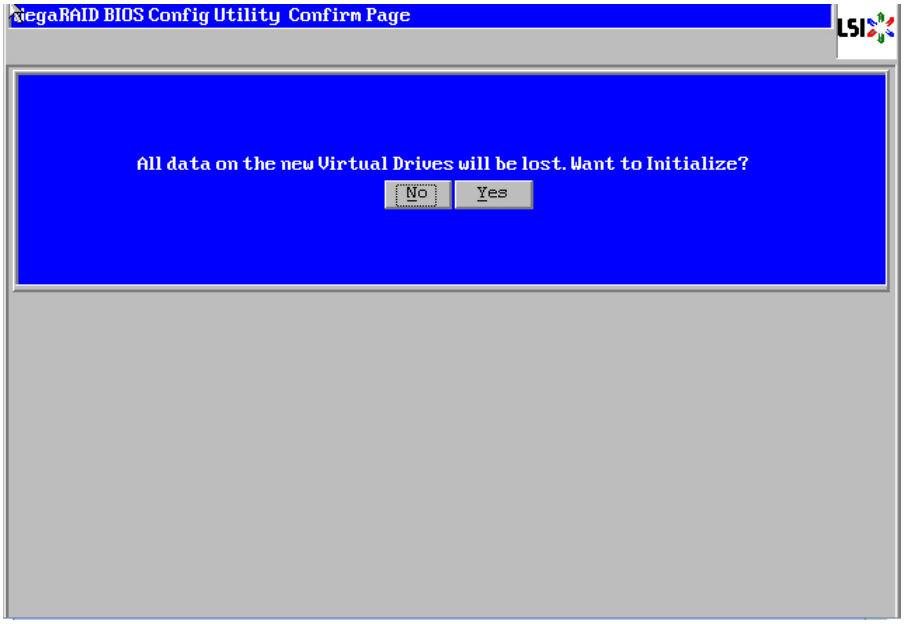


Figure 4-24

12. Click [Yes] to save configuration, RAID array configuration completes, and then enter the screen below:

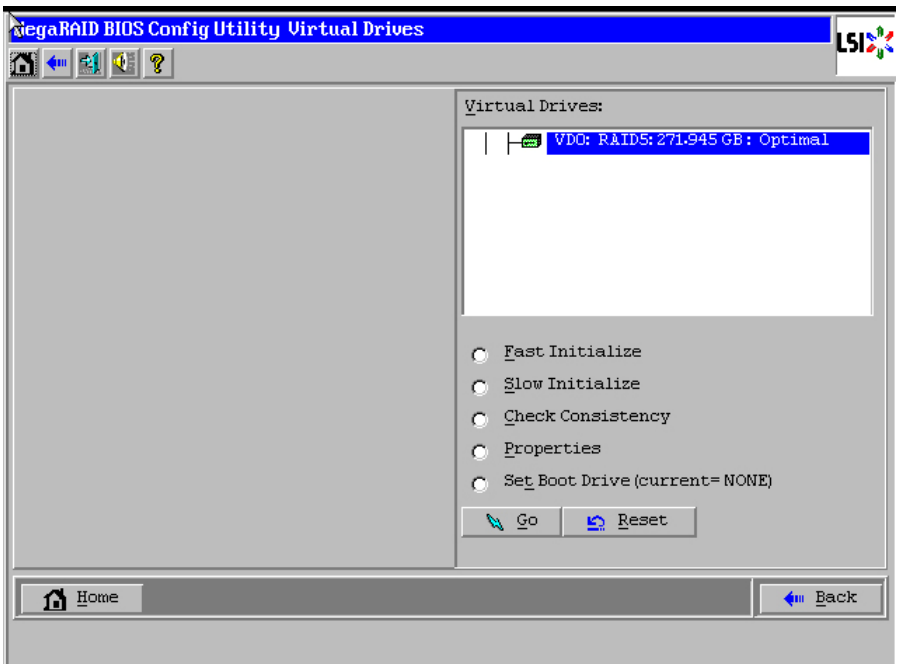


Figure 4-25

On this screen, you can select fast initialization. After [Fast Initialize] is selected, click [Go] to start array initialization.

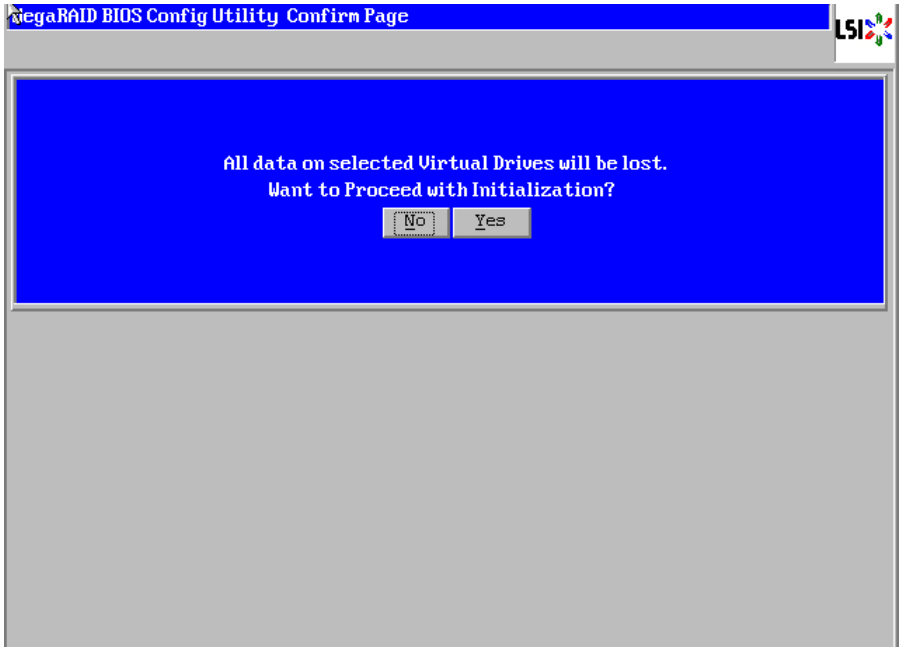


Figure 4-26

Select [Yes] to start initialization. Upon initialization, press [Home] to go back.

4.4.7 Physical View Menu

Physical View: Physical drive screen lists properties and content of selected physical device and physical device that can be operated, as shown in below figure:

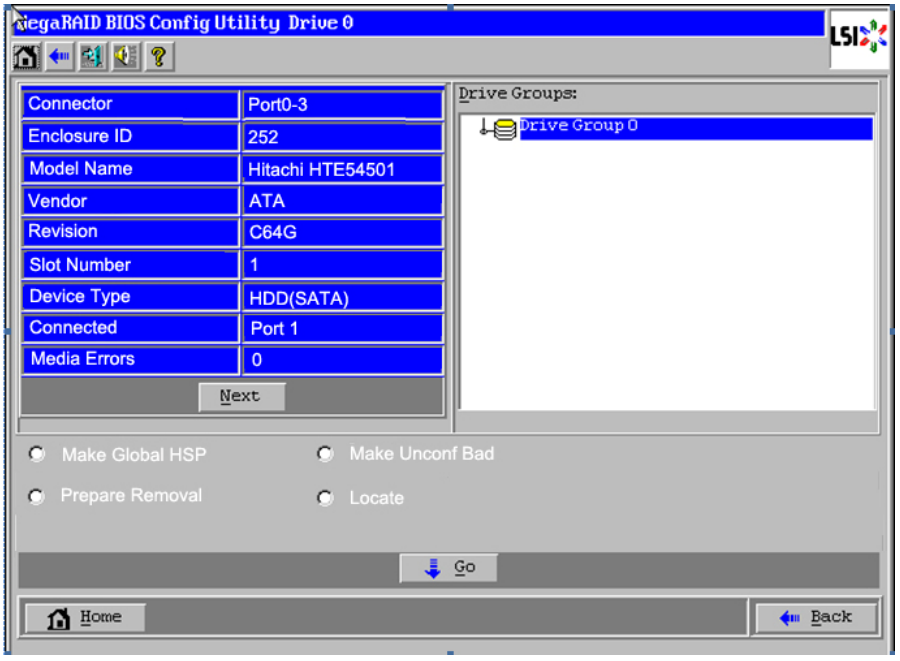


Figure4-27

Physical device properties are read only and custom description, including status properties of

physical device. Changes in operation list at the bottom of screen depend on drive status. If an option is selected, click [Go] to begin operation.

1. [Make Global HSP]: Force to adopt HSP mode.

2. [Locate]: Make LED of physical device blink. It is available only when device have been mounted on disk ports.

3. [Make Unconf Bad]: If a selected hard disk is separate from disk array, it can be used as global hot spare drive or partial hot spare drive for certain array.

4. [Prepare Removal]: A ready-to-move option may appear.

4.4.8 Events Menu

SAS controller Firmware monitors all storage configuration, system device status and performance. When an event occurs (for example, create a new virtual drive or move a physical device), a piece of event information will be generated and saved in NVRAM of controller. Click [Events] in WebBIOS main screen, and then event information will appear, as shown in figure 4-28.

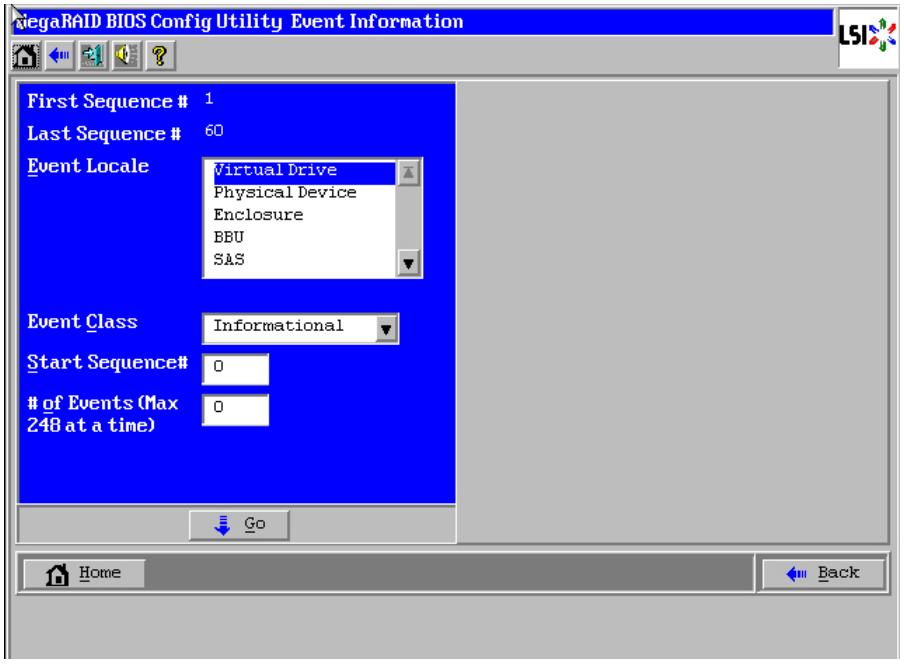


Figure 4-28

Attention

The right area of the screen is blank until an event is selected.

Follow these steps to view event information:

1. Select an event in menu, and for example, select [Enclosure to view information of events

associated with disk. Event types include Information, Warning, Misidentification, Fatal Fault and Full Fault.

2. Enter a beginning sequence number.

3. Enter an event type you want to view, and click [Go]. Then the first event in the sequence will be displayed on the right panel.

4. Click [Next] and [Prev] to view next or previous page event information.

5. If you want to view other event information, select a different event standard on the left side of panel, then click [Go].

6. Event information includes event occurrence time and detailed description.

4.4.9 Exit Menu

Select this menu and press Enter to exit configuration program.

Chapter 5 MSM Software

MAM is the abbreviation of MegaRaid Storage Manager. It enables you to configure, monitor and change configurations on controllers. Its graphical user interface makes use easier. It supports the Windows and Linux operating systems. Its management functions are similar to WebBIOS Configuration Utility – a Html-based configuration tool we have expatiated in previous chapter. So only the installation and notes are concerned in this chapter, but the configuration and application guide are not covered. Here we only introduce the installation in the Windows operating systems.

5.1 MSM Installation

MegaRaid Storage Manager software is an object-oriented GUI storage manager software, which can monitor, configure and manage both local and remote storage arrays.

5.1.1 MSM Functions

1. Disk array configuration wizard;

2. Online seamlessly extended FlexRAID function;

3. RAID level migration;

4. Array performance monitoring;

5. Pre-define the conformity check for calendar data;

6. SMART and SAF-TE management features supported.

5.1.2 MSMInstallation Environment

The hardware requirements for MegaRaid Storage Manager software are as follows: Processor: Intel IA-32(32-bit) or EM64T(64-bit); Memory: 128 Mbytes or above (256 Mbytes recommended)

Available free space of hard disk: 50 Mbytes or above

5.1.3 MSM Installation Procedures

Follow these steps to install the software:

1. Insert the installation CD contained in the RAID card package into your CD-ROM drive. Open the MSM\6.90-05_Windows_MSM\DISK1 folder and double-click the setup.exe file to start the MSM Installation Program. A screen appears as shown in Figure 5-1.

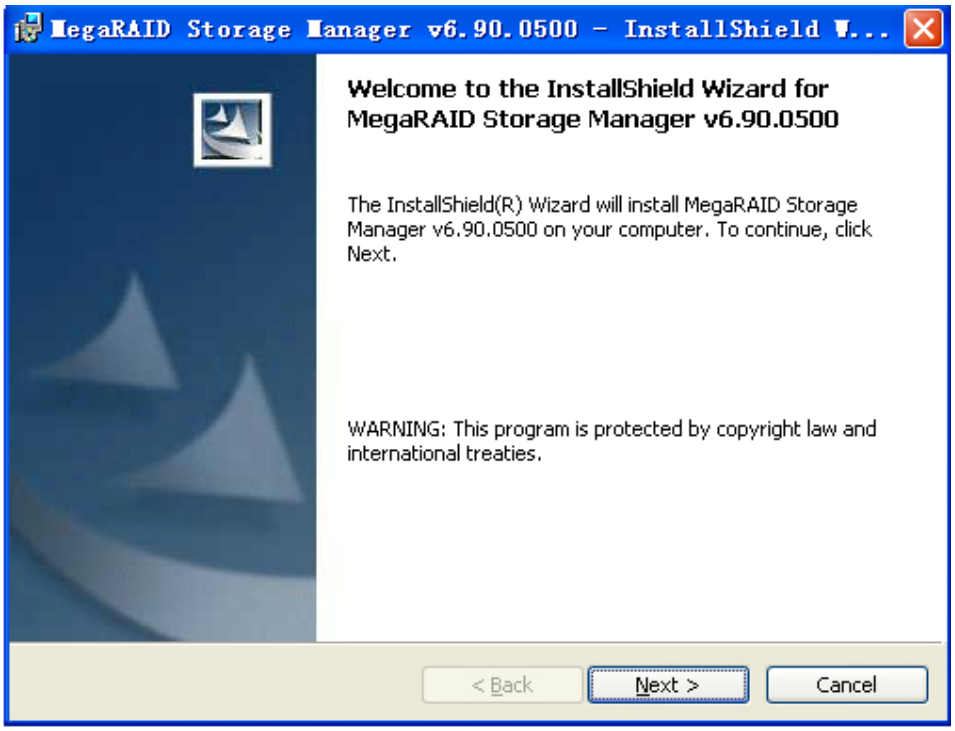

MegaRAID Storage Manager v6.90.0500 - InstallShield W...
Welcome to the InstallShield Wizard for MegaRAID Storage Manager v6.90.0500
The InstallShield(R) Wizard will install MegaRAID Storage Manager v6.90.0500 on your computer. To continue, click Next.
WARNING: This program is protected by copyright law and international treaties.
< Back
Next >
Cancel

Figure5
-1

2. Click <Next> on the screen as shown in Figure 5-1, and then the next screen appears as Figure 5-2.

Note: If you have already installed the software before, the below screen appears and you are prompted to select Remove, Modify or Repair.

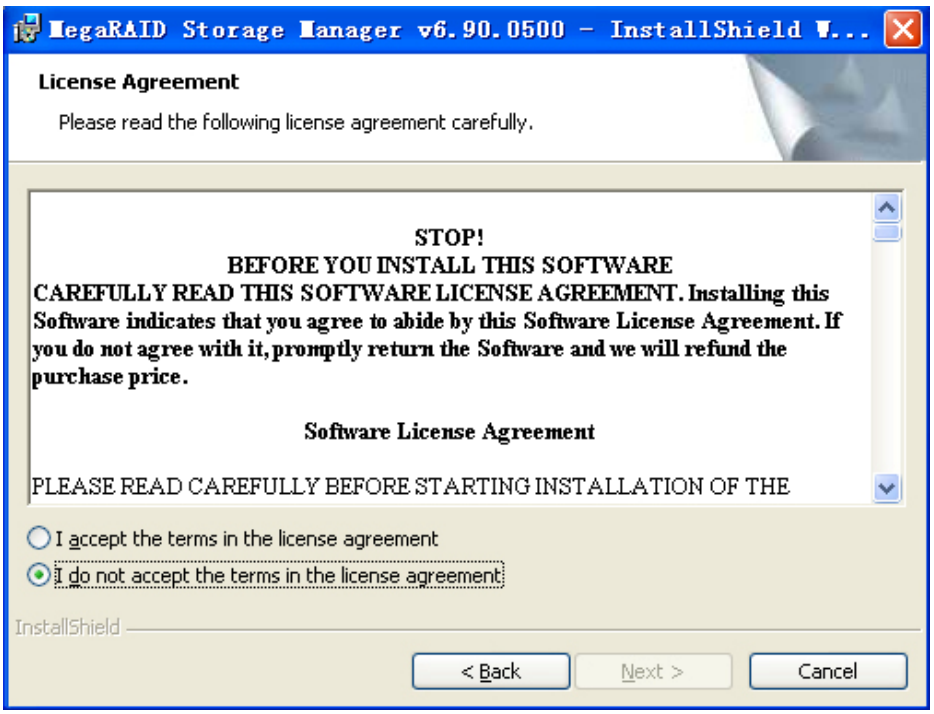

MegaRAID Storage Manager v6.90.0500 - InstallShield W...
License Agreement
Please read the following license agreement carefully.
STOP!
BEFORE YOU INSTALL THIS SOFTWARE
CAREFULLY READ THIS SOFTWARE LICENSE AGREEMENT. Installing this Software indicates that you agree to abide by this Software License Agreement. If you do not agree with it, promptly return the Software and we will refund the purchase price.
Software License Agreement
PLEASE READ CAREFULLY BEFORE STARTING INSTALLATION OF THE
I accept the terms in the license agreement
I do not accept the terms in the license agreement
InstallShield
< Back
Next >
Cancel

Figure5
-2

3. Carefully read and select " I accept the terms in the license agreement", and click <Next>. The next screen appears, as shown in Figure 5-3:

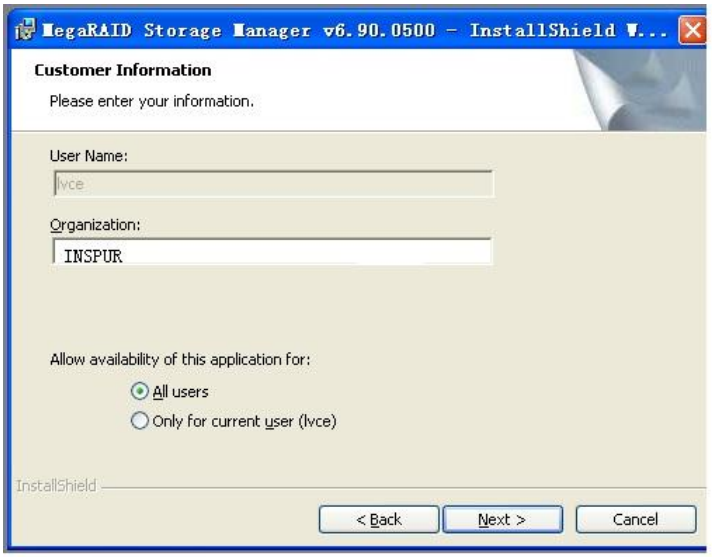


Figure 5-3

4. Enter your user name and organization name. If you select <All users>, all users have administrative privileges. Click <Next> to continue. On the next screen as shown in Figure 5-4,

you can select an installation path.

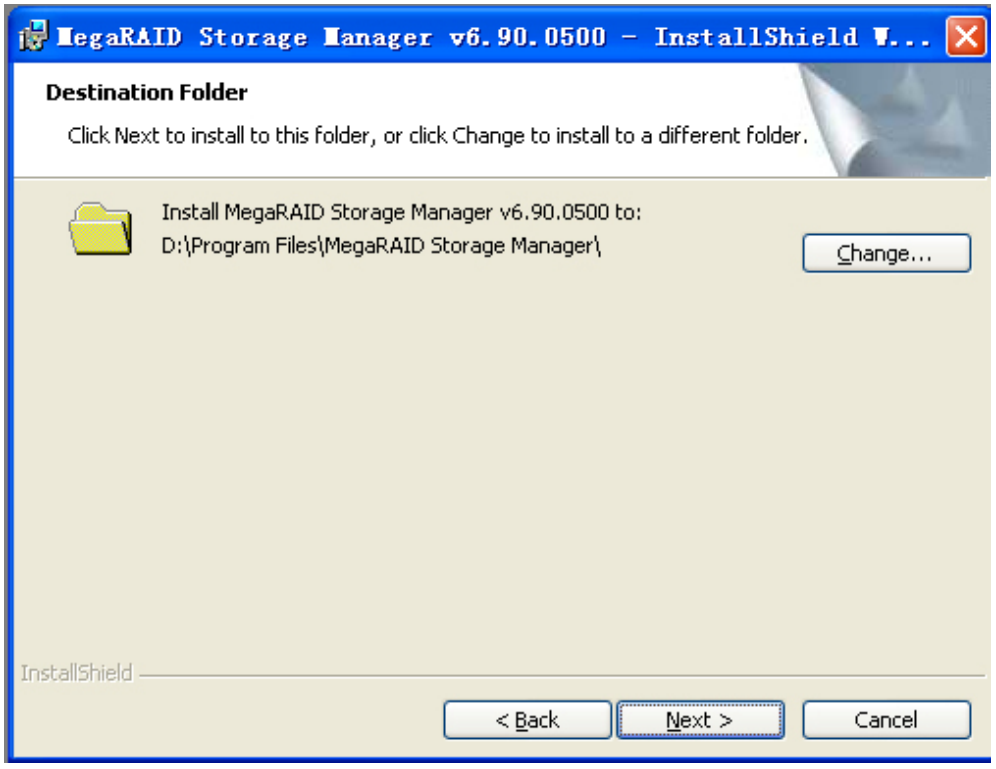

MegaRAID Storage Manager v6.90.0500 - InstallShield W...
Destination Folder
Click Next to install to this folder, or click Change to install to a different folder.
Install MegaRAID Storage Manager v6.90.0500 to:
D:\Program Files\MegaRAID Storage Manager\
Change...
InstallShield
< Back
Next >
Cancel

Figure 5-4

5. Click <next> to continue, and then new screen appears as shown in 5-5.

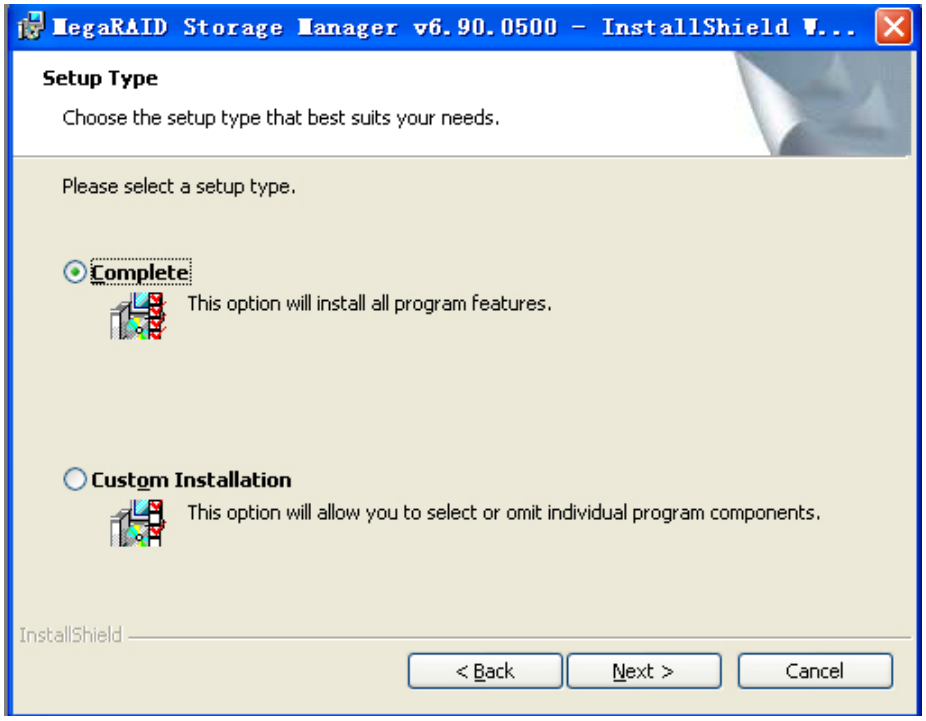

MegaRAID Storage Manager v6.90.0500 - InstallShield W...
Setup Type
Choose the setup type that best suits your needs.
Please select a setup type.
Complete
This option will install all program features.
Custom Installation
This option will allow you to select or omit individual program components.
InstallShield
< Back
Next >
Cancel

Figure 5-5

6. You can select a setup type depending on your requirement. Click <Next> to continue, and then the next screen appears as shown in figure 5-6:

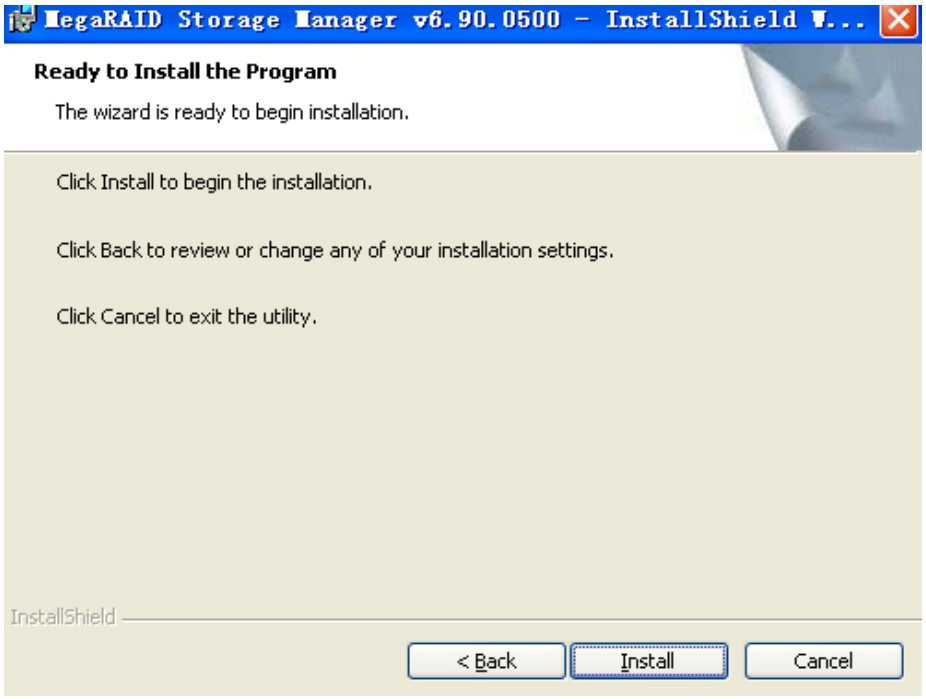
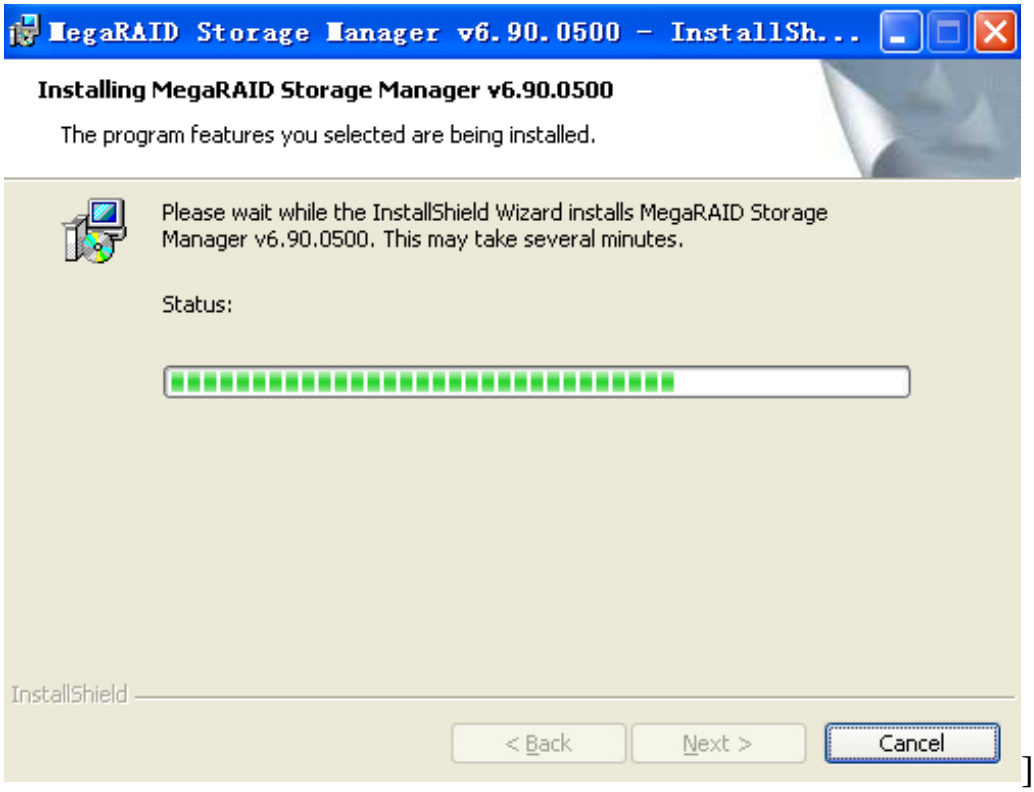

MegaRAID Storage Manager v6.90.0500 - InstallShield W...
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
Click Back to review or change any of your installation settings.
Click Cancel to exit the utility.
InstallShield
< Back
Install
Cancel

Figure 5-6

Click <Install> to install the program. When it completes, the next screen appears as shown in Figure 5-7:


MegaRAID Storage Manager v6.90.0500 - InstallSh...
Installing MegaRAID Storage Manager v6.90.0500
The program features you selected are being installed.
Please wait while the InstallShield Wizard installs MegaRAID Storage Manager v6.90.0500. This may take several minutes.
Status:
InstallShield
< Back
Next >
Cancel

]

Figure 5-7

Click <Finish> when installation completes.

5.1.4 MSM Utility

1. Starting MSM: Select Start->Programs-> MegaRaid Storage Manager ->StartupUI, or double-click the MSM shortcut on the desktop.
2. When the program starts, the next screen appears, as shown in Figure 5-8:

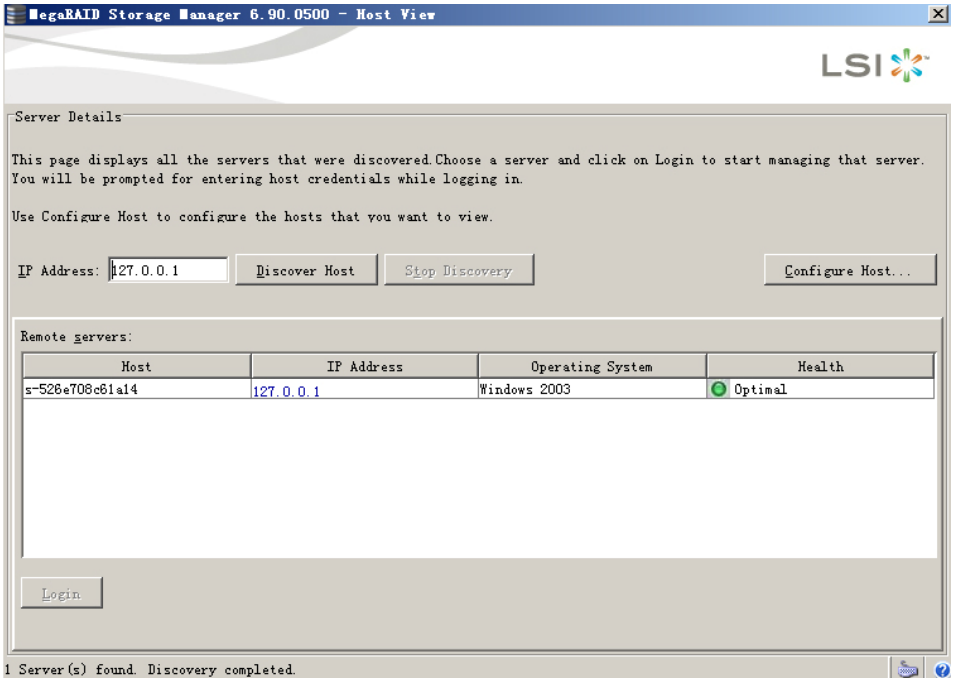


Figure 5-8

If the circle before the <optimal> is green, it means that the server is running in the normal state.

3. Double-click the icon of the server that you want to log in; the next screen appears, as shown in Figure 5-9:

Figure5-9

4. Select login mode from the pull-down menu. If you need to view and change the configuration, select <Full Access>. If you only need to view and monitor the configuration, select <View Only>.

5. Enter your user name and password, and click <Login>. The main MegaRaid Storage Manager screen appears, as shown in Figure 5-10.

5.2 MSM Window

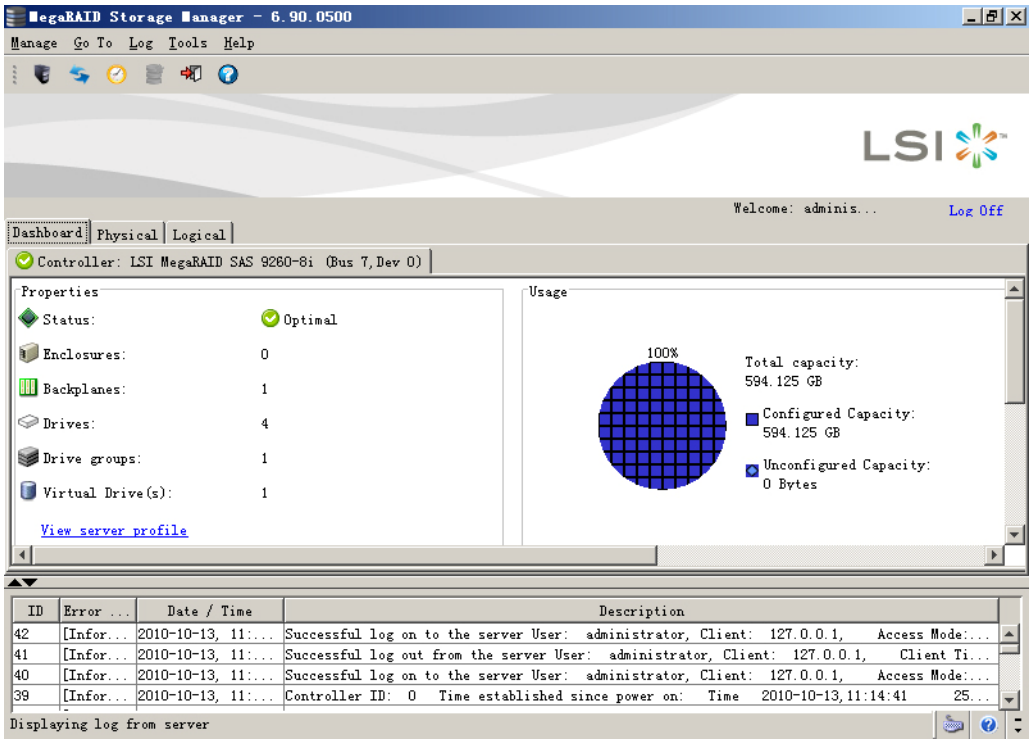


Figure 5-10

Here we give an introduction on main options in each sub menu. Those options not commonly used will not be expatiated any more.

1. Manage Refresh: Refresh software configuration screen or you can press F5 to perform this operation.

Server: Display basic information of server to be managed.

Check Consistency: Array Consistency check menu.

Initialize: Virtual disk Initialization Menu, it can be used to initialize virtual drive.

Show Progress: Show progress of array consistency check.

Exit: exit the software

2. Go To

Controller: Select a master controller, and then you can perform operations on it.

Create Virtual Drive: Create a virtual array.

Disable Alarm: Disable RAID card alarm.

Silence Alarm: RAID card silence option.

Update Controller Firmware: Update RAID card firmware.

Physical Drive: Option to perform operations on physical drive.

Virtual Drive: Option to perform operations on physical drive.

3. Log

Save: Save event log as file in log format.

Save as text: Save event log as file in txt format.

Clear: Clear event log.

Load: Load event log saved before.

4. Tools

Configure Alerts: Configure transfer mode of alerts.

5. Help Contents: Illumination documents for management software. You can refer to it when facing problems.

About MegaRAID Storage Manager: Display software version and version information.

5.3 MSM Configuration

The main screen of MSM configuration is shown in Figure 5-11

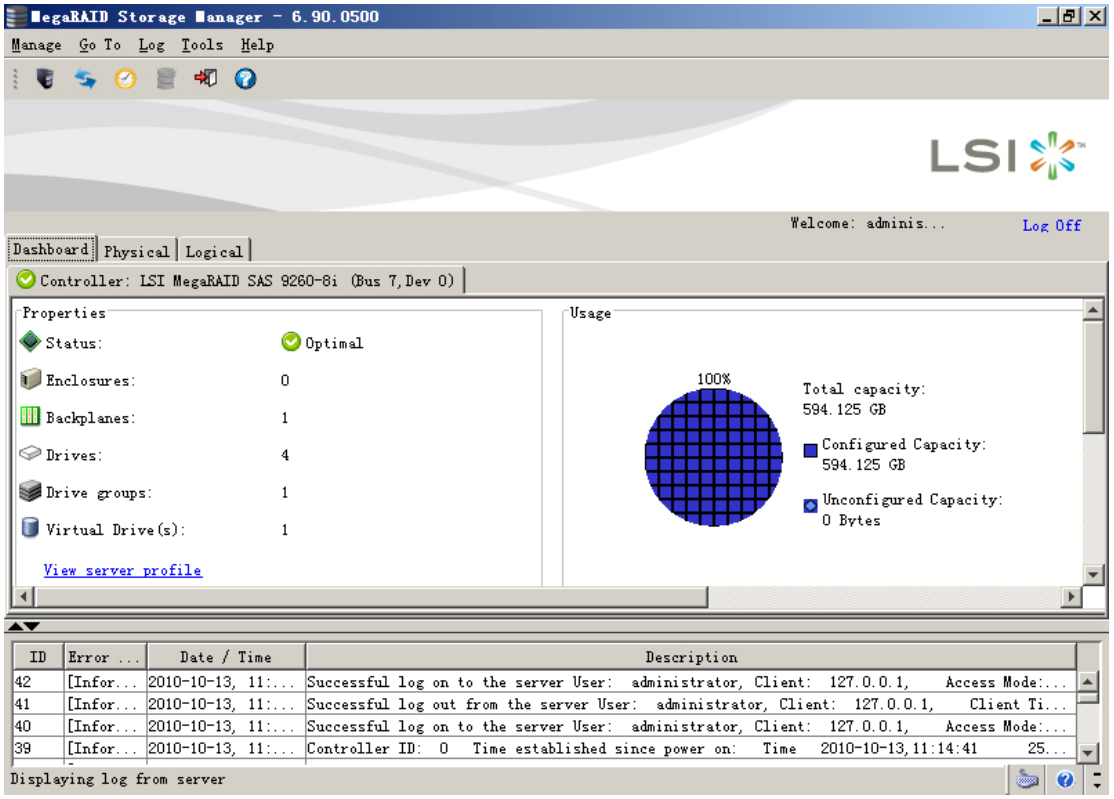

MegaRAID Storage Manager - 6.90.0500
Manage Go To Log Tools Help
LSI
Welcome: adminis...
Log Off
Dashboard
Physical
Logical
Controller: LSI MegaRAID SAS 9260-8i (Bus 7, Dev 0)
Properties
Status: Optimal
Enclosures: 0
Backplanes: 1
Drives: 4
Drive groups: 1
Virtual Drive(s): 1
View server profile
Usage
100%
Total capacity: 594.125 GB
Configured Capacity: 594.125 GB
Unconfigured Capacity: 0 Bytes
ID Error ... Date / Time Description
42 [Infor... 2010-10-13, 11:... Successful log on to the server User: administrator, Client: 127.0.0.1, Access Mode:...
41 [Infor... 2010-10-13, 11:... Successful log out from the server User: administrator, Client: 127.0.0.1, Client Ti...
40 [Infor... 2010-10-13, 11:... Successful log on to the server User: administrator, Client: 127.0.0.1, Access Mode:...
39 [Infor... 2010-10-13, 11:... Controller ID: 0 Time established since power on: Time 2010-10-13,11:14:41 25...
Displaying log from server

Figure 5-11

The main screen is divided into three parts:

1. Dashboard

Display status of master controller and hard disks, as shown in figure 5-11.

Using View server profile, detailed information on managed host can be displayed, when you can view it by directly clicking relative link.

2. Physical

Display information on physical drives in the system, as shown in figure 5-12.

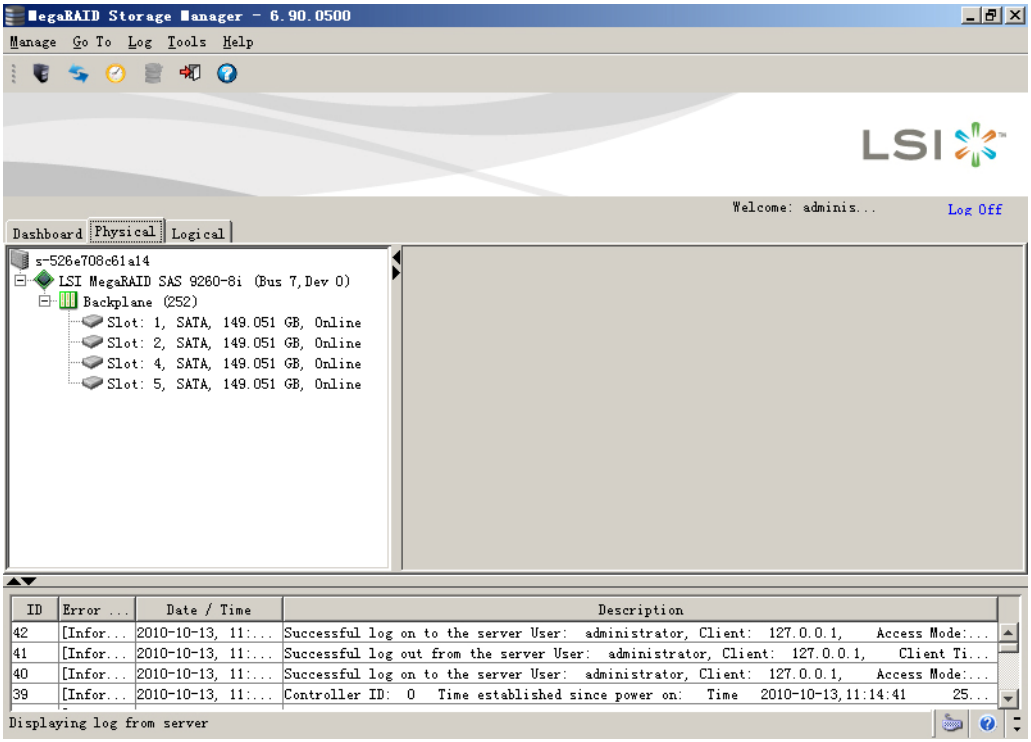

MegaRAID Storage Manager - 6.90.0500
Manage Go To Log Tools Help
LSI
Welcome: adminis...
Log Off
Dashboard Physical Logical
s-526e708c61a14
LSI MegaRAID SAS 9260-8i (Bus 7, Dev 0)
Backplane (252)
Slot: 1, SATA, 149.051 GB, Online
Slot: 2, SATA, 149.051 GB, Online
Slot: 4, SATA, 149.051 GB, Online
Slot: 5, SATA, 149.051 GB, Online
ID Error ... Date / Time Description
42 [Infor... 2010-10-13, 11:... Successful log on to the server User: administrator, Client: 127.0.0.1, Access Mode:...
41 [Infor... 2010-10-13, 11:... Successful log out from the server User: administrator, Client: 127.0.0.1, Client Ti...
40 [Infor... 2010-10-13, 11:... Successful log on to the server User: administrator, Client: 127.0.0.1, Access Mode:...
39 [Infor... 2010-10-13, 11:... Controller ID: 0 Time established since power on: Time 2010-10-13,11:14:41 25...
Displaying log from server

Figure5-12

3. Logical

Display information on logical disks in the system, as shown in figure 5-13.

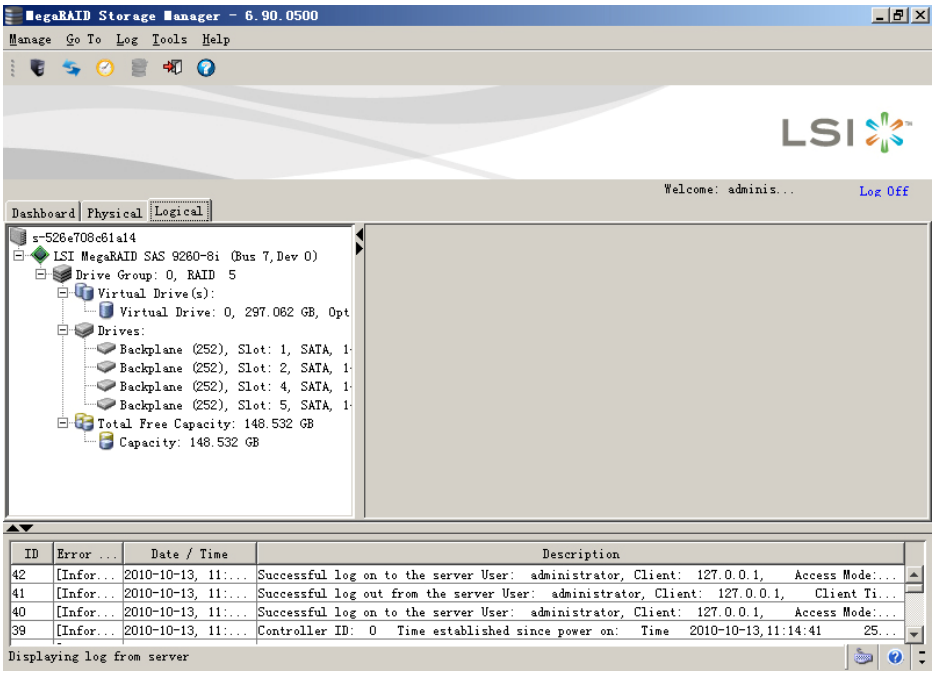

MegaRAID Storage Manager - 6.90.0500
Manage Go To Log Tools Help
LSI
Welcome: adminis...
Log Off
Dashboard Physical Logical
s-526e708c61a14
LSI MegaRAID SAS 9260-8i (Bus 7, Dev 0)
Drive Group: 0, RAID 5
Virtual Drive(s):
Virtual Drive: 0, 297.062 GB, Opt
Drives:
Backplane (252), Slot: 1, SATA, 1
Backplane (252), Slot: 2, SATA, 1
Backplane (252), Slot: 4, SATA, 1
Backplane (252), Slot: 5, SATA, 1
Total Free Capacity: 148.532 GB
Capacity: 148.532 GB
ID Error ... Date / Time Description
42 [Infor... 2010-10-13, 11:... Successful log on to the server User: administrator, Client: 127.0.0.1, Access Mode:...
41 [Infor... 2010-10-13, 11:... Successful log out from the server User: administrator, Client: 127.0.0.1, Client Ti...
40 [Infor... 2010-10-13, 11:... Successful log on to the server User: administrator, Client: 127.0.0.1, Access Mode:...
39 [Infor... 2010-10-13, 11:... Controller ID: 0 Time established since power on: Time 2010-10-13,11:14:41 25...
Displaying log from server

Figure5-13

Appendix A: Technical Support

If you have any questions or problems that can’t be solved during using Inspur server, please feel free to:

1. Contact your product provider when you have any questions about product configuration and specification.

2. Directly contact the Inspur Server Technical Support Center when your computer system has any problems. Our technical staff will offer solution or on-site maintenance after receiving your service request.

3. You can contact the Inspur Server Technical Support Center by telephone or through e-mail:

Technical Service Telephone: 86-531-88546554 Free Hotline: 800 8600011

E-mail: sv_str_pcs@inspur.com